

FY 2012/2013 Design Standards

John Mauthner and Rebecca Hatton

Overview

- New Design Standards Process
- Changes to the Design Standards
 - Roadway, Landscape, ITS and Planning Standards
- Design Standards Revisions
 - What are Design Standards Revisions?
 - When do you expect them?
 - How do you incorporate them?
- New Website Design
 - How to use it
 - What is there and what isn't

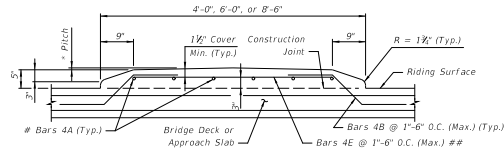
Design Standards Process

- Now an annual book based on Florida's Fiscal Year
 - (current is FY 2012/2013)
- Available only online
 - Printed copies are no longer available through the Maps and Publications office

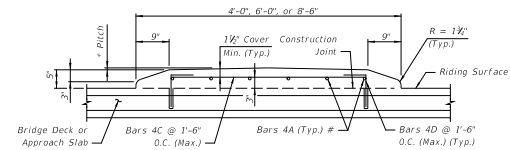
Changes to the Design Standards Deleted Indexes

- Indexes 100, 101, 102, 103 and 106
 - For details formerly contained on these deleted Indexes see the "Florida Erosion and Sediment Control Manual"
- Index 417
- Index 430
- Index 490
- Index 520
 - Now Index 6011
- Index 826
- Index 850
- Index 860
- Index 5100
- Index 5300
- Index 17749
 - moved to Developmental Design Standards

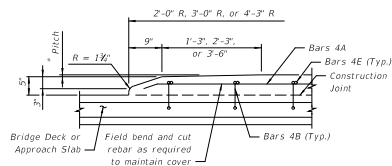
Index 302 Sheet 2



TYPICAL SECTION THRU TRAFFIC SEPARATOR
(Bridge Deck Shown, Approach Slab Similar)



TYPICAL SECTION THRU TRAFFIC SEPARATOR
(Bridge Deck Shown, Approach Slab Similar)

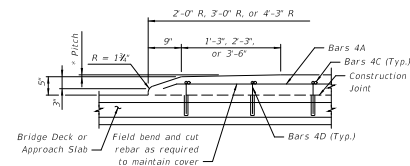


LONGITUDINAL SECTION THRU TRAFFIC SEPARATOR AT NOSE
(Bridge Deck Shown, Approach Slab Similar)

For 4'-0" width: Bars 4A @ 3 equal spaces (continuous).
For 6'-0" width: Bars 4A @ 5 equal spaces (continuous).
For 8'-6" width: Bars 4A @ 7 equal spaces (continuous).

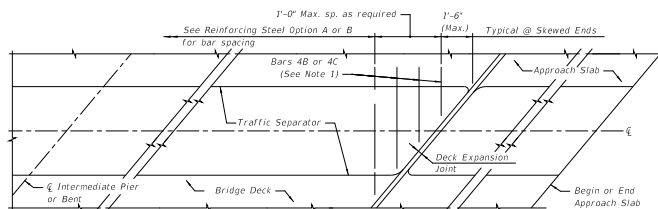
At the Contractor's option a one piece bar may be substituted for Bars 4B and 4E.

* Pitch: 1/2" For 4'-0" Separator
1/2" For 6'-0" Separator
3/4" For 8'-6" Separator



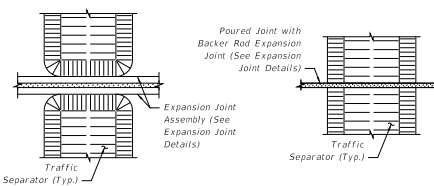
LONGITUDINAL SECTION THRU TRAFFIC SEPARATOR AT NOSE
(Bridge Deck Shown, Approach Slab Similar)

REINFORCING STEEL OPTION B (NOT PERMITTED ON BRIDGE DECKS WITH PRESTRESSING STEEL)



PARTIAL PLAN VIEW OF SKEWED BRIDGE DECK AND APPROACH SLAB WITH TRAFFIC SEPARATOR
(Deck Expansion Joint at Begin or End Bridge Show, Expansion Joint at \bar{C} Pier or Intermediate Bents Similar)

- Notes:
1. Traffic Separator transverse reinforcement adjacent to deck expansion joints shall be field adjusted to maintain clearance and spacing. Bars shall be field cut as shown, bars may be rotated to maintain clearance.
 2. Traffic Separator ends at deck expansion joints shall follow the deck joint limits. Drainage joints and 1/2" V-Grooves shall be placed perpendicular or radial to the \bar{C} of the Traffic Separator. See Structures Plans, Superstructure and Approach Slab Sheets for details.
 3. See Structures Plans, Superstructure Sheets for actual dimensions and joint orientation.



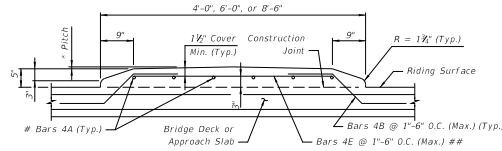
DETAIL AT EXPANSION JOINTS
(Strip Seal Shown, Other Armored Joint Types Similar)

DETAIL AT POURED JOINT WITH BACKER ROD EXPANSION JOINTS
(See Expansion Joint Details)

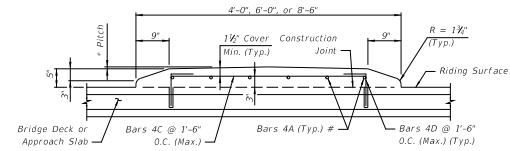
BRIDGE INSTALLATIONS - TYPE "E" CURB

LAST REVISION 01/01/11	DESCRIPTION	FDOT DESIGN STANDARDS FY 2012/2013	TRAFFIC SEPARATORS	INDEX NO. 302	SHEET NO. 2
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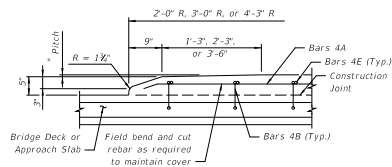
Index 302 Sheet 2



TYPICAL SECTION THRU TRAFFIC SEPARATOR
(Bridge Deck Shown, Approach Slab Similar)



TYPICAL SECTION THRU TRAFFIC SEPARATOR
(Bridge Deck Shown, Approach Slab Similar)

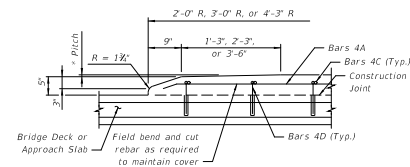


LONGITUDINAL SECTION THRU TRAFFIC SEPARATOR AT NOSE
(Bridge Deck Shown, Approach Slab Similar)

For 4'-0" width: Bars 4A @ 3 equal spaces (continuous).
For 6'-0" width: Bars 4A @ 5 equal spaces (continuous).
For 8'-6" width: Bars 4A @ 7 equal spaces (continuous).

At the Contractor's option a one piece bar may be substituted for Bars 4B and 4E.

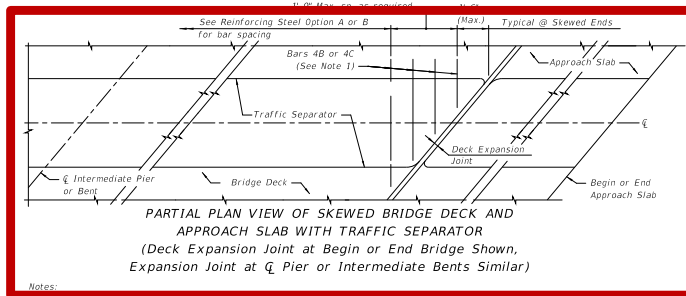
* Pitch: 1/2" For 4'-0" Separator
1/2" For 6'-0" Separator
3/4" For 8'-6" Separator



LONGITUDINAL SECTION THRU TRAFFIC SEPARATOR AT NOSE
(Bridge Deck Shown, Approach Slab Similar)

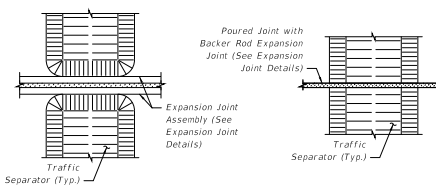
REINFORCING STEEL OPTION A

REINFORCING STEEL OPTION B (NOT PERMITTED ON BRIDGE DECKS WITH PRESTRESSING STEEL)



PARTIAL PLAN VIEW OF SKEWED BRIDGE DECK AND APPROACH SLAB WITH TRAFFIC SEPARATOR
(Deck Expansion Joint at Begin or End Bridge Slab, Expansion Joint at Pier or Intermediate Bents Similar)

- Notes:
1. Traffic Separator should be installed on bridge deck at deck expansion joints similar to those proposed for the bridge deck spanning.
 2. Traffic Separator ends at deck expansion joints shall follow the deck joint limits. Drainage joints and 1/2" V-Grooves shall be placed perpendicular or radial to the centerline of the Traffic Separator. See Structures Plans, Superstructure and Approach Slab Sheets for details.
 3. See Structures Plans, Superstructure Sheets for actual dimensions and joint orientation.



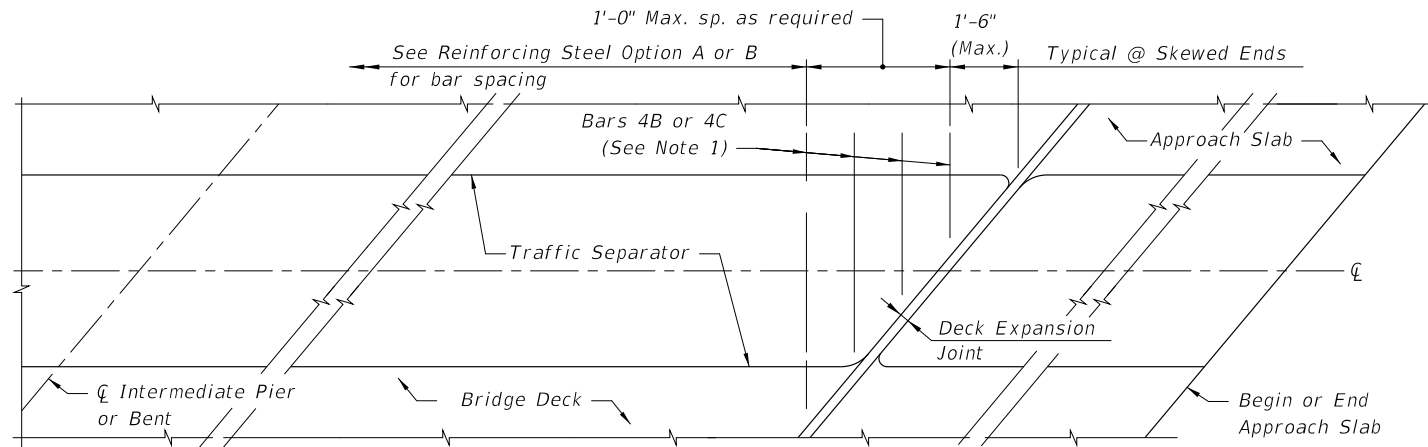
DETAIL AT EXPANSION JOINTS
(Strip Seal Shown,
Other Armored Joint Types Similar)

DETAIL AT POURED JOINT WITH
BACKER ROD EXPANSION JOINTS
(See Expansion Joint Details)

BRIDGE INSTALLATIONS - TYPE "E" CURB

LAST REVISION 01/01/11	DESCRIPTION	FDOT DESIGN STANDARDS FY 2012/2013	TRAFFIC SEPARATORS	INDEX NO. 302	SHEET NO. 2
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Detail from Deleted Index 490



**PARTIAL PLAN VIEW OF SKEWED BRIDGE DECK AND
APPROACH SLAB WITH TRAFFIC SEPARATOR**
(Deck Expansion Joint at Begin or End Bridge Shown,
Expansion Joint at ζ Pier or Intermediate Bents Similar)

Index 304

GENERAL NOTES

- Public sidewalk curb ramps shall be constructed in the public right of way at locations that will provide continuous unobstructed pedestrian circulation paths to pedestrian areas, elements and facilities in the public right of way, and to accessible pedestrian routes on adjacent sites. Curbed facilities with sidewalks and those without sidewalks are to have curb ramps constructed at all street intersections and at turnouts that have curbed returns. Partial curb returns shall extend to the limit prescribed by Index No. 515 to accommodate curb ramps. Ramps constructed at locations without sidewalks shall have a landing constructed at the top of each ramp. See Sheet 5.
- The location and orientation of curb ramps shall be as shown in the plans.
- Curb ramp running slopes at unrestrained sites shall not be steeper than 1:12 and cross slope shall be 0.02 or flatter. Transition slopes shall not be steeper than 1:12.

When altering existing pedestrian facilities where existing site development precludes the accommodation of a ramp slope of 1:12, a running slope between 1:12 and 1:10 is permitted for a rise of 6" maximum and a running slope of between 1:10 and 1:8 is permitted for a rise of 3" maximum. Where compliance with the requirements for cross slope cannot be fully met, the minimum feasible cross slope shall be provided.

Ramp running slope is not required to exceed 8' in length, except at sites where the plans specify a greater length.

- If a curb ramp is located where pedestrians must walk across the ramp, then the walk shall have transition slopes to the ramp; the maximum slope of the transitions shall be 1:12. Ramps with curb returns may be used at locations where other improvements provide guidance away from that portion of curb perpendicular to the sidewalk; improvements for guidance are not required at curb ramps for linear pedestrian traffic.
- Curb ramp detectable warning surfaces shall extend the full width of the ramp and 24" deep. Detectable warning surfaces shall be constructed in accordance with Specification S27. See Sheet 6 for detectable warning layouts. Transition slopes are not to have detectable warnings. Detectable warnings are required on sidewalks at intersecting roads, streets and railroads. For requirements for detectable warnings on sidewalks at intersecting driveways, see Index 310.
- Where a curb ramp is constructed within existing curb, curb and gutter and/or sidewalk, the existing curb or curb and gutter shall be removed to the nearest joint beyond the curb transitions or to the extent that no remaining section of curb or curb and gutter is less than 5' long. The existing sidewalk shall be removed to the nearest joint beyond the transition slope or walk around or to the extent that no remaining section of sidewalk is less than 5' long. For details of Concrete Sidewalk See Index 310.
- Alpha-numeric identifications are for reference (plans, permits, etc.).
- Public sidewalk curb ramps are to be paid for as follows:
Ramps, reconstructed sidewalks, walk around sidewalks, sidewalk landings and sidewalk curbs are to be paid for under the contract unit price for Sidewalk Concrete, (___" Thick), 5Y. Curb transitions and reconstructed curbs are to be paid for under the contract unit price for the parent curb, i.e. Concrete Curb (Type ___, LF) or Concrete Curb and Gutter (Type ___, LF).
When a separate pay item for the removal and disposal of existing curb, curb and gutter, and/or sidewalk is not provided in the plans, the cost of removal and disposal of these features shall be included in the contract unit price for new curb, curb and gutter and/or sidewalk respectively.
- Acceptance Criteria for Detectable Warnings:
 - The ramp detectable warning surface shall be complete and uniform in color and texture
 - 90% of the individual truncated domes must comply with the design criteria
 - There may be no more than 4 non-complying domes in any one square foot of surface
 - No two adjacent domes may be non-compliant
 - Surface may not deviate more than 0.10" from a true plane
- All sidewalk surfaces, ramp surfaces, and landings with a cross slope shown in this Index to be 0.02 shall be 0.02 maximum. All ramp surfaces and ramp transition slopes with a slope shown in this Index to be 1:12 shall be 1:12 maximum.

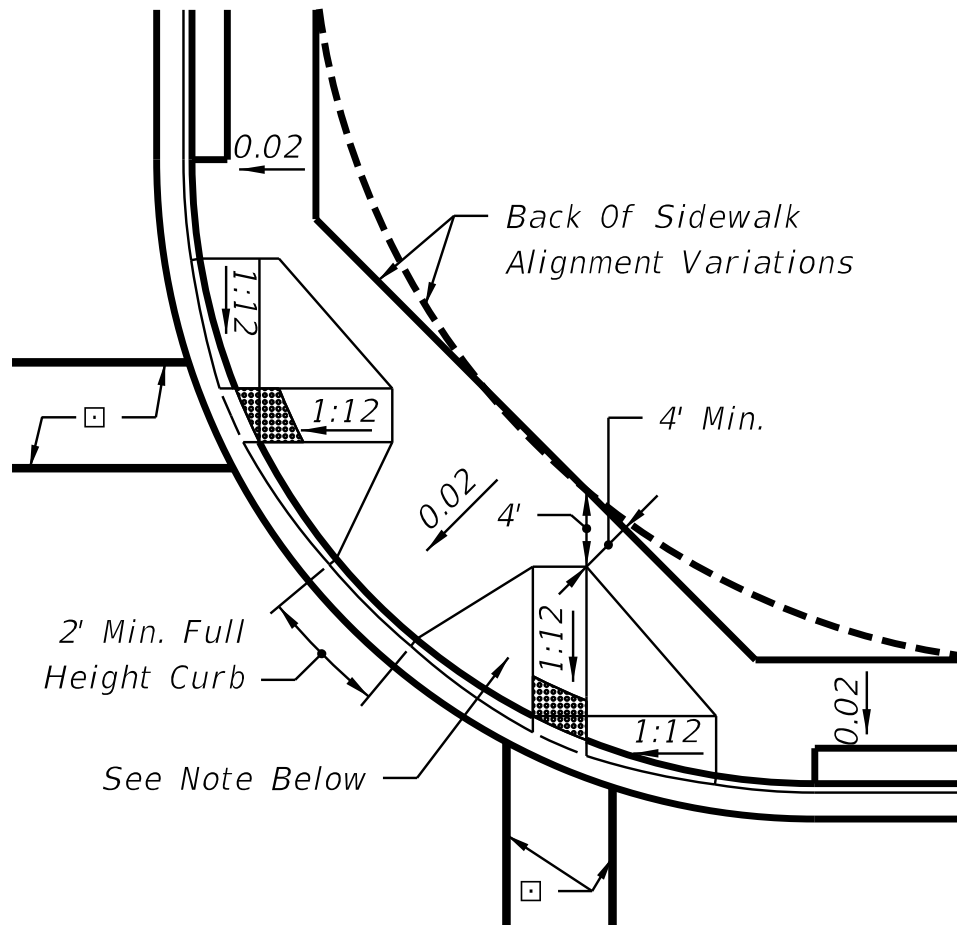
TYPICAL PLACEMENT OF PUBLIC SIDEWALK CURB RAMPs AT CURBED RETURNS

LAST REVISION	DESCRIPTION
01/01/11	

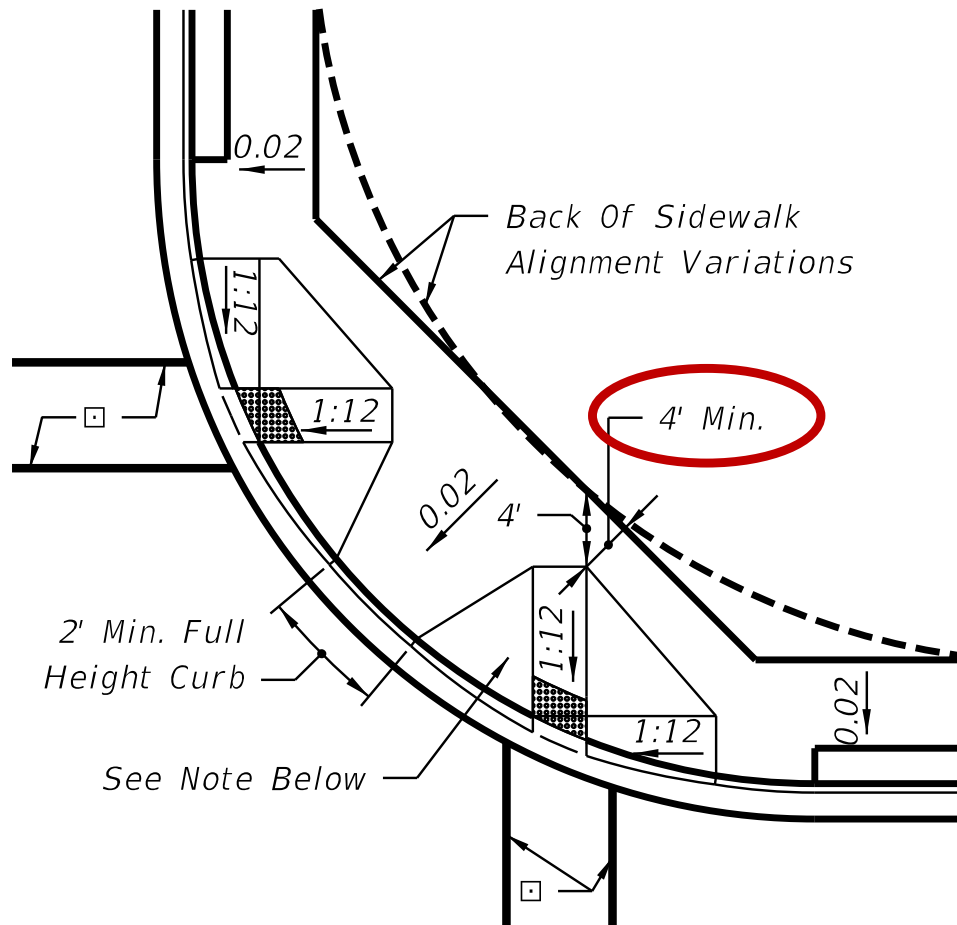
	FDOT DESIGN STANDARDS FY 2012/2013
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PUBLIC SIDEWALK CURB RAMPs	INDEX NO. 304	SHEET NO. 1
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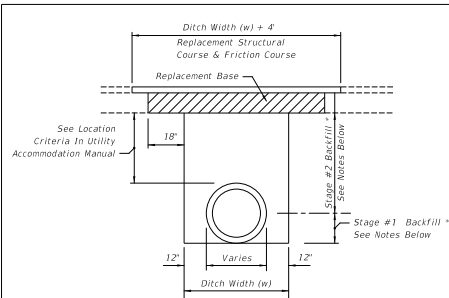
Index 304



Index 304



Index 307 Sheet 1



FLEXIBLE PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

Pavement shall be mechanically sawed.
The replacement asphalt shall match the existing structural and friction courses for type and thickness in accordance with current FDOT asphalt mix specifications.

The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 514).

BACKFILL

COMPACTED AND STABILIZED FILL OPTION

Backfill material shall be placed in accordance with Section 125 of the Standard Specifications.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct compacted fill along the sides of the pipe and up to the bottom of the base with the upper 12" receiving Type B Stabilization. In lieu of Type B Stabilization, the Contractor may construct using Optional Base Group 3.

* FLOWABLE FILL OPTION

If compaction can not be achieved through normal mechanical methods then flowable fill may be used.

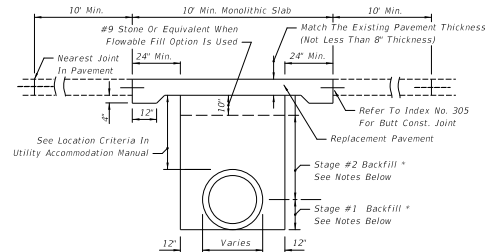
Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the existing base course.

FLEXIBLE PAVEMENT CUT



RIGID PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

High early strength cement concrete (3000 psi) meeting the requirements of Standard Specification 346 shall be used for rigid pavement replacement.

Pavement shall be mechanically sawed and restored to conform with existing pavement joints within 12 hours. (See Index No. 305)

GRANULAR BACKFILL

Any edgeline system that is removed shall be replaced with the same type materials. Any edgeline system that is damaged shall be repaired with methods approved by the Engineer.

Fill material shall be placed in accordance with the Standard Specifications. Fill material shall be special select soil in accordance with Index No. 505.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct fill along the sides of the pipe and up to the bottom of replacement pavement.

* FLOWABLE FILL OPTION

If mechanical compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the stone layer.

RIGID PAVEMENT CUT

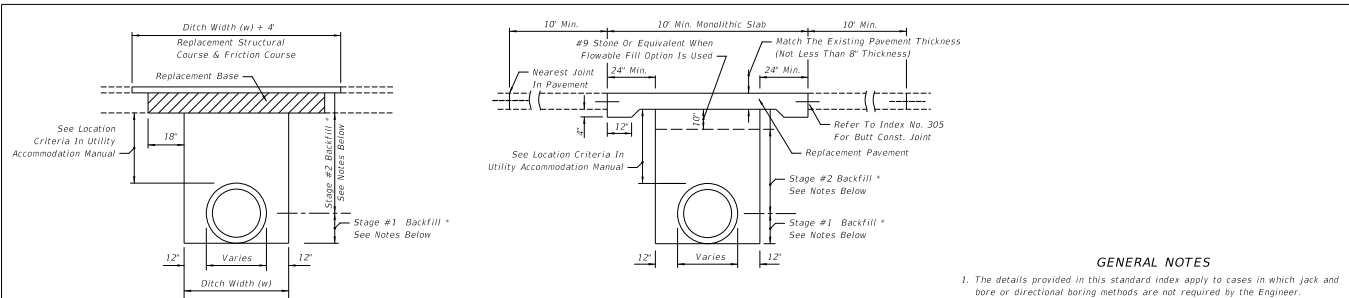
TRENCH CUTS AND RESTORATIONS ACROSS ROADWAYS

LAST REVISION 01/01/10	DESCRIPTION: REVISION		FDOT DESIGN STANDARDS FY 2012/2013	MISCELLANEOUS UTILITY DETAILS	INDEX NO. 307	SHEET NO. 1

GENERAL NOTES

- The details provided in this standard index apply to cases in which jack and bore or directional boring methods are not required by the Engineer.
- Flowable fill shall not be placed directly over loose, or high plastic, or much material (see Index 505) which will cause settlement due to fill weight. Where highly compressible material exists, the amount, shape and depth of flowable fill must be engineered to prevent pavement settlement.
- These details do not apply to utility cuts longitudinal to the centerline of the roadway which may require the additional use of geotextiles, special bedding and backfill, or other special requirements.
- Method of construction must be approved by the Engineer.
- Some pipe may require special granular backfill up to 6" above top of pipe. Geotextiles may be required to encapsulate the special granular material.
- Where asphalt concrete overlays exist over full slab concrete pavement, the replacement pavement shall have an overlay constructed over the replacement slab. The overlay shall match the existing asphalt pavement thickness. The replacement friction course shall match the existing friction course, except structural course may be used in lieu of dense graded friction course.
- All shoulder pavement, curb, curb and gutter, and their substructure disturbed by utility trench cut construction shall be restored in kind.
- The use of flowable fill to reduce the time traffic is taken off a facility is acceptable but must have prior approval by the Engineer. Flowable fill use is allowed only when properly engineered for pavement crossings, whether straight or diagonal, and shall not be installed for significant depths or lengths. The maximum length shall be fifty (50) feet and a maximum depth of six (6) feet unless supported by an engineering document prepared by a registered professional engineer that specializes in soils engineering. The engineering document shall address the evaluation of local groundwater flow interruption and settlement potential.
- Excavatable flowable fill is to be used when the flowable fill option is selected.
- When approved by the Engineer, in lieu of the pavement and base, non-excavatable flowable fill may be used for manhole stabilization and ring and cover adjustments. Excavatable flowable fill shall not be used within the limits of the pavement and base.

Index 307 Sheet 1



FLEXIBLE PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

Pavement shall be mechanically sawed.

The replacement asphalt shall match the existing structural and friction courses for pipe and thickness in accordance with current FDOT asphalt mix specifications

The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 51)

BACKFILL

COMPACTED AND STABILIZED FILL OPTION

Backfill material shall be placed in accordance with Section 125 of the Standard Specifications.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct compacted fill along the sides of the pipe and up to the bottom of the base with the upper 12" receiving Type B Stabilization. In lieu of Type B Stabilization, the Contractor may construct using Optional Base Group 3.

*** FLOWABLE FILL OPTION**

If compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the existing base course.

FLEXIBLE PAVEMENT CUT

RIGID PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

High early strength cement concrete (3000 psi) meeting the requirements of Standard Specification 346 shall be used for rigid pavement replacement.

Pavement shall be mechanically sawed and restored to conform with existing pavement joints within 12 hours. (See Index No. 305)

GRANULAR BACKFILL

Any edge drain system that is removed shall be replaced with the same type materials. Any edge drain system that is damaged shall be repaired with methods approved by the Engineer.

Fill material shall be placed in accordance with the Standard Specifications. Fill material shall be special select soil in accordance with Index No. 505.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct fill along the sides of the pipe and up to the bottom of replacement pavement.

*** FLOWABLE FILL OPTION**

If mechanical compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

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RIGID PAVEMENT CUT

- GENERAL NOTES**
- The details provided in this standard index apply to cases in which jack and bore or directional boring methods are not required by the Engineer.
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 - These details do not apply to utility cuts longitudinal to the centerline of the roadway which may require the additional use of geotextiles, special bedding and backfill, or other special requirements.
 - Method of construction must be approved by the Engineer.
 - Some pipe may require special granular backfill up to 6" above top of pipe. Geotextiles may be required to encapsulate the special granular material.
 - Where asphalt concrete overlays exist over full slab concrete pavement, the replacement pavement shall have an overlay constructed over the replacement slab. The overlay shall match the existing asphalt pavement thickness. The replacement friction course shall match the existing friction course, except structural course may be used in lieu of dense graded friction course.
 - All shoulder pavement, curb, curb and gutter, and their substructure disturbed by utility trench cut construction shall be restored in kind.
 - The use of flowable fill to reduce the time traffic is taken off a facility is acceptable but must have prior approval by the Engineer. Flowable fill use is allowed only when properly engineered for pavement crossings, whether straight or diagonal, and shall not be installed for significant depths or lengths. The maximum length shall be fifty (50) feet and a maximum depth of six (6) feet unless supported by an engineering document prepared by a registered professional engineer that specializes in soils engineering. The engineering document shall address the evaluation of local groundwater flow interruption and settlement potential.
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 - When approved by the Engineer, in lieu of the pavement and base, non-excavatable flowable fill may be used for manhole stabilization and ring and cover adjustments. Excavatable flowable fill shall not be used within the limits of the pavement and base.

LAST REVISION 01/01/10		DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	MISCELLANEOUS UTILITY DETAILS	INDEX NO. 307	SHEET NO. 1

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Index 307 Sheet 1

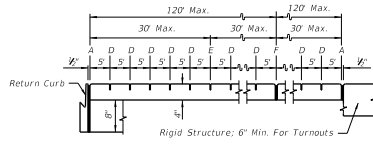
PAVEMENT REMOVAL AND REPLACEMENT

Pavement shall be mechanically sawed.

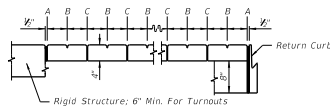
The replacement asphalt shall match the existing structural and friction courses for type and thickness in accordance with current FDOT asphalt mix specifications

The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 514).

Index 310



NOTE: "E" Joints Required When Length Exceeds 30'
SAWED JOINTS



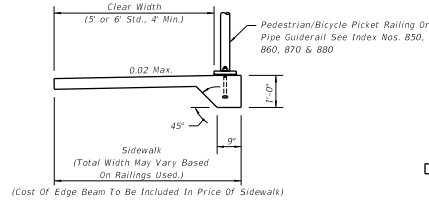
NOTE: "E" Joints Required When Length Exceeds 30'
**OPEN JOINTS
EXAGGERATED SCALE
LONGITUDINAL SECTION
SIDEWALK JOINTS**

JOINT LEGEND

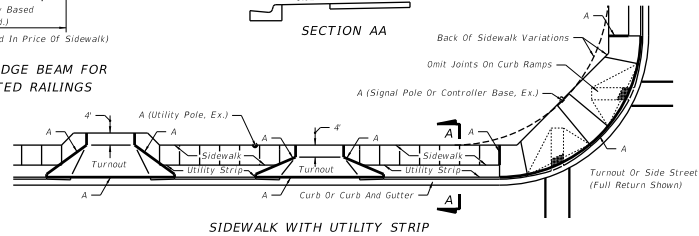
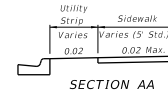
- A- $\frac{1}{2}$ " Expansion Joints (Performed Joint Filler)
- B- $\frac{1}{2}$ " Dummy Joints, Tooled
- C- $\frac{1}{2}$ " Formed Open Joints
- D- $\frac{1}{2}$ " Saw Cut Joints, 1 $\frac{1}{2}$ " Deep (within 96 hours) Max. 5' Centers
- E- $\frac{1}{2}$ " Saw Cut Joints, 1 $\frac{1}{2}$ " Deep (within 12 hours) Max. 30' Centers
- F- $\frac{1}{2}$ " Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.
- G-Cold Joint With Bond Breaker, Tooled

NOTES FOR CONCRETE SIDEWALK ON CURBED ROADWAYS

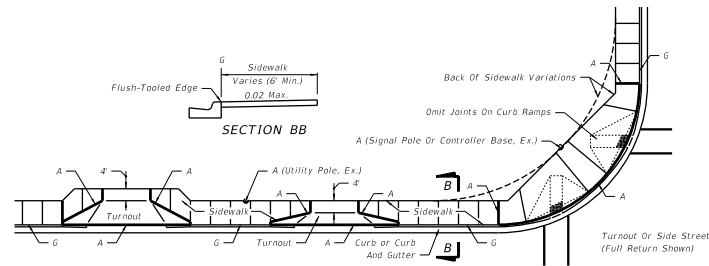
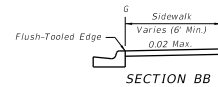
1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications. Public sidewalk curb ramps shall include detectable warnings and be constructed in accordance with Index No. 304. Detectable warnings are not required where sidewalks intersect urban flared turnouts.
2. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils nor more than $\frac{1}{2}$ ".
3. For turnouts see Index No. 515.
4. Construct sidewalks with 1" thick Edge Beam through the limits of any surface mounted Pedestrian/Bicycle Picket Railing or Pipe Guiderail shown in the plans.
5. Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (___Thick), S.Y.



(Cost Of Edge Beam To Be Included In Price Of Sidewalk)
**SIDEWALK WITH EDGE BEAM FOR
SURFACE MOUNTED RAILINGS**



SIDEWALK WITH UTILITY STRIP

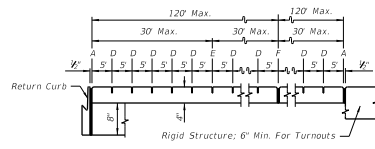


SIDEWALK WITHOUT UTILITY STRIP

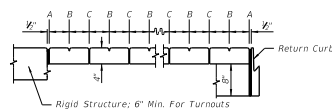
CONCRETE SIDEWALK FOR CURBED ROADWAYS

LAST REVISION 01/01/10	DESCRIPTION		FDOT DESIGN STANDARDS FY 2012/2013	CONCRETE SIDEWALK	INDEX NO. 310	SHEET NO. 1
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Index 310



NOTE: "E" Joints Required When Length Exceeds 30'
SAWED JOINTS



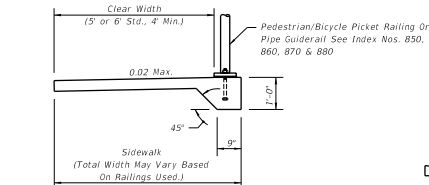
NOTE: "E" Joints Required When Length Exceeds 30'
**OPEN JOINTS
EXAGGERATED SCALE
LONGITUDINAL SECTION
SIDEWALK JOINTS**

JOINT LEGEND

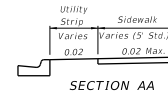
- A- ∇ : Expansion Joints (Performed Joint Filler)
- B- ∇ : Dummy Joints, Tooled
- C- ∇ : Formed Open Joints
- D- ∇ : Saw Cut Joints, 1 ∇ : Deep (within 96 hours) Max. 5' Centers
- E- ∇ : Saw Cut Joints, 1 ∇ : Deep (within 12 hours) Max. 30' Centers
- F- ∇ : Expansion Joint When Run Of Sidewalk Exceeds 120'.
Intermediate locations when called for in the plans or at locations as directed by the Engineer.
- G- Cold Joint With Bond Breaker, Tooled

NOTES FOR CONCRETE SIDEWALK ON CURBED ROADWAYS

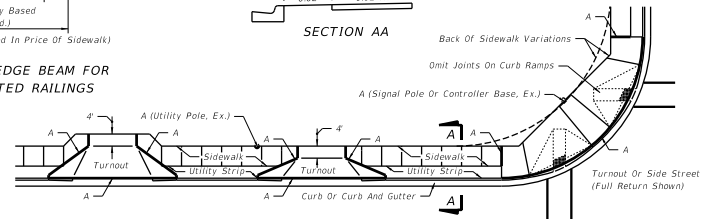
1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications. Public sidewalk curb ramps shall include detectable warnings and be constructed in accordance with Index No. 304. Detectable warnings are not required where sidewalks intersect urban flared turnouts.
2. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils nor more than $\frac{1}{2}$ ".
3. For turnouts see Index No. 515.
4. Construct sidewalks with 1" thick Edge Beam through the limits of any surface mounted Pedestrian/Bicycle Picket Railing or Pipe Guiderail shown in the plans.
5. Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (___Thick), S.Y.



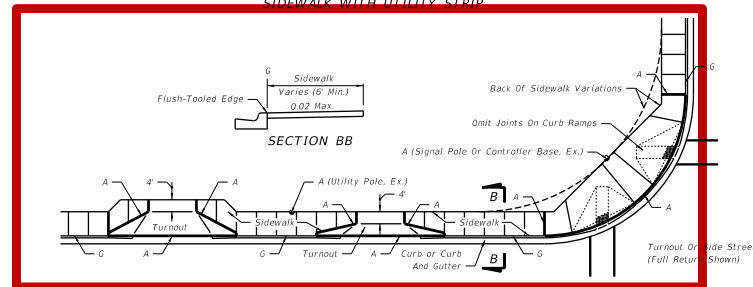
(Cost Of Edge Beam To Be Included In Price Of Sidewalk)
**SIDEWALK WITH EDGE BEAM FOR
SURFACE MOUNTED RAILINGS**



SECTION AA



SIDEWALK WITH UTILITY STRIP

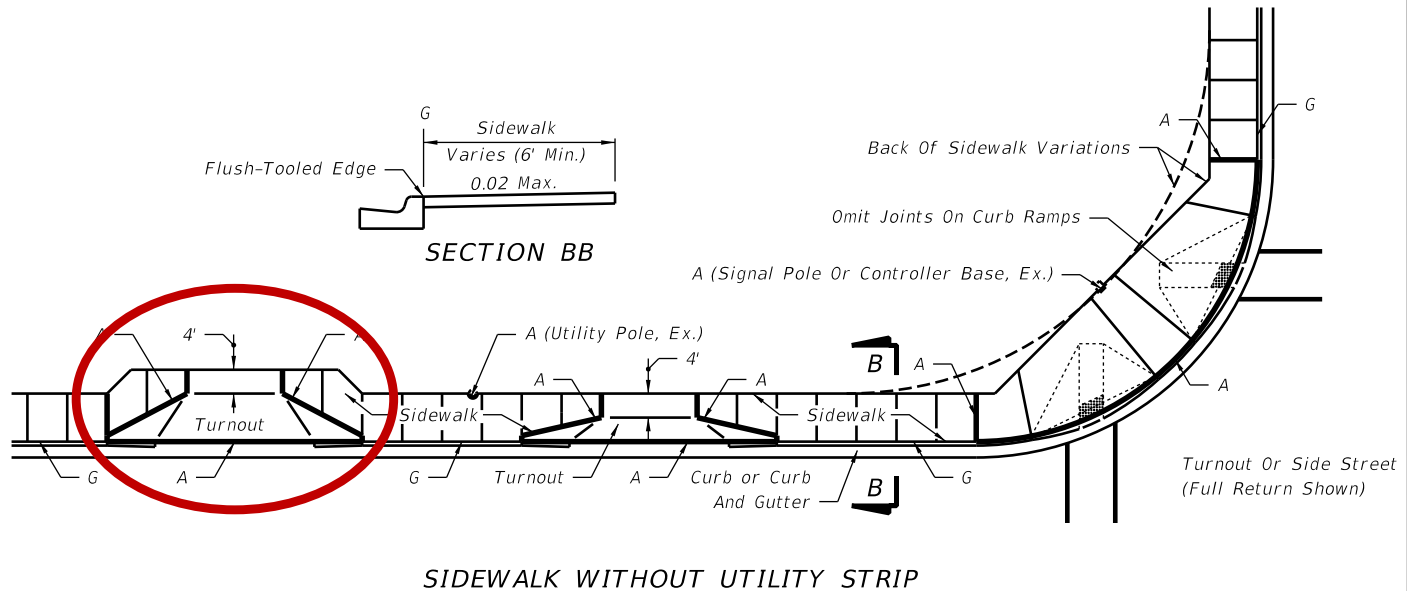


SIDEWALK WITHOUT UTILITY STRIP

CONCRETE SIDEWALK FOR CURBED ROADWAYS

LAST REVISION 01/01/10	DESCRIPTION	FDOT DESIGN STANDARDS FY 2012/2013	CONCRETE SIDEWALK	INDEX NO. 310	SHEET NO. 1
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Index 310



Index 400 Sheet 1

GENERAL NOTES

- The illustrations for guardrail applications are standard configurations; adjustments are to be made as required by site specific conditions to attain optimum design for function, economy and serviceability.
- The beginning of guardrail need shall be at the greatest of the upstream distances from the hazard, as determined from Figures 1 and 2, and other application details of this Index.
- One Panel (i.e., panel length) equals 12'-6". Guardrail shall be constructed with rail elements 12'-6" in length except where 25'-0" elements are called for by this and other standards (indexes) or specifically called for in the plans.

Post spacing shall be 6'-3" except that reduced spacing shall be used for (a) transitions to anchorages at rigid structures such as bridges (See Detail J and Index No. 402) and transitions to retroductive crash cushions, (b) the conditions in Note No. 7 below, (c) special post applications, (d) reduced post spacing required for specific end anchorage assemblies, and, (e) specific spacing called for in the plans.
- Guardrail mounting height for the W-beam without rub rail and for three-beam is 1'-9" to the center of beam, and for W-beam with rub rail 2'-0" to center of beam. Modified three-beam shall be mounted at a height of 2'-0" to center of beam. The height is critical and shall be attained in all cases; a tolerance of 3" above and 1" below the standard mounting heights is permissible over necessary surface irregularities (e.g., across shoulder gutters, inlets and roadway surface break lines). For guardrail placed on slopes beyond the shoulder point, there shall be no deviation more than 1" below to 3" above the desired height within any 25 foot section of guardrail.
- All guardrail panels, end sections and special end shoes shall be lapped in the direction of adjacent traffic.
- Flared end anchorage assemblies providing 4' offset are the standard end treatments for single face free standing guardrail approach ends. Parallel end anchorage assemblies for guardrail approach end treatments will be constructed only when restraints prevent construction of flared end anchorages.

Guardrail end anchorage assemblies shall be of the type called for in the plans. If the plans call for end anchorage assembly "flared" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved flared assembly provided in this Index or identified on the Qualified Products List (QPL), subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

If the plans call for end anchorage assembly "parallel" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved parallel assembly provided in this Index or identified on the QPL, subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

If the plans call for a specific end anchorage assembly, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. Approved substitutions will not be eligible for CSIP consideration.

When an end treatment is attached to guardrail with Pedestrian Safety Treatment, only end treatment systems with timber posts are to be used.

Existing approved proprietary end anchorage systems are identified on the Qualified Products List (QPL). After January 1, 2013 - manufacturers seeking approval of new proprietary end anchorage systems for inclusion on the QPL, must submit application along with design documentation showing the end anchorage system; is crash tested to Test Level 3 criteria in accordance with the Manual for Assessing Safety Hardware (MASH), is accepted by FHWA for use as a guardrail end anchorage system, and is compatible with FDOT guardrail systems. System approvals will be contingent on FDOT's evaluation of crash test performance results for consistency with FDOT guardrail application and use. If approved, installation drawings signed and sealed by a professional engineer licensed in the State of Florida will be required.
- At above ground rigid hazards where the face of guardrail is offset from the hazard less than the 4' minimum for standard W-beam, other guardrail configurations with reduced post spacing may be applicable; see General Note No. 11 and the minimum offset table on Sheet 19. For guardrail with post spacing less than 6'-3" the reduced spacing should extend a minimum of one panel in advance of the hazard. When minimum offset cannot be attained safety shape concrete barrier wall shall be used unless other shielding is approved by the Engineer of Record. See Index No. 410 for safety shape concrete barrier walls and typical applications, and the plans for special barrier shapes and applications.
- In addition to use at roadside hazards or other areas where the Engineer has deemed guardrail necessary, guardrail should be considered on flush shoulder sections where fill slopes are steeper than 1:3 within the clear zone and fill heights are 6' or greater. Curbed sections where fill slopes are steeper than 1:3 and fill heights are 6' or greater within 22' of the traveled way should be evaluated for installation of guardrail. Additional guidance for evaluating the need for guardrail can be found in the Plans Preparation Manual.
- The guardrail to bridge connections contained in this Index are for bridges with Test Level 4 traffic railing barriers. For guardrail to concrete barrier wall connections see Index No. 410. For existing bridges receiving retrofit traffic railing barriers see Index No. 402.
- The W-beam guardrail system in this index is the standard system to be used on the State Highway System where a Test Level 3 semi-rigid barrier is required.
- Three-beam guardrail panels shall be used in guardrail transitions to bridge traffic railing barriers, to concrete and certain water filled safety shaped barriers, certain crash cushions and as a continuous barrier when called for in the plans. For additional information on rail attachment, post spacings, nested rails, location of three-beam transition panels and offset block configurations see details elsewhere in this Index, and Index Nos. 402, 410 and 414. The use of three-beam guardrail with standard offset blocks (Test Level 3 semi-rigid system) may be considered where one or more of the conditions listed below or similar conditions are anticipated or exist:
 - W-beam deflection is marginal,
 - W-beam with rub rail considered functionally deficient,
 - Vehicle overriding W-beam is probable,
 - Drainage will be impeded or blocked by the use of concrete barrier wall (subject to deflection space requirements),
 - High frequency of repairs to W-beam,
 - Spandrel beam with low deflection needed around unrellocatable structure,
 - Accommodating passenger vehicles heavier or larger than the standard passenger car (e.g., passenger vans and small buses).

The modified three-beam guardrail is a Test Level 4 semi-rigid system and may be used where a Test Level 4 guardrail is required.
- Single face median guardrail for bridges located on divided roadways shall be constructed the same as outer roadway guardrail under the following conditions:
 - Wide medians where approach end anchor is located outside of opposing roadway clear zone,
 - Medians of uniform width that are occupied by other transportation and joint use facilities,
 - Medians of uniform or variable widths with independent vertical alignments not suited to normal median guardrail installations,
 - Medians of bifurcated roadways.
- Straight rail section may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shop-bent) to fit.
- Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in lieu of Type II assemblies located in the approach clear zones.
- Corrugated sheet steel beams, end shoes, end sections and backup plates shall conform to the current requirements of AASHTO M180, Class A, Type II (zinc) coating. All other metallic components, hardware and accessories shall be in conformance with the appropriate current AASHTO requirements.
- Offset blocks:
 - Steel offset blocks other than modified three-beam offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS are tabulated on Sheet 16.
 - Plastic offset block installations shall be constructed on guardrail outside of approach end anchorage assemblies or any transition system connecting to a rigid or three-beam barrier.
- Where necessary to enlarge or add holes to galvanized guardrail, the work will be done by drilling or reaming. Damaged galvanized guardrail will be metalized in accordance with Sections 562 and 971 of the Standard Specifications. No burning of holes will be permitted.
- For guardrail reflector details see Sheet 17.
- Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using timber or steel posts. Repair within a run of guardrail with existing concrete posts can be made with either steel, timber, sound salvaged concrete posts; replacement in kind of damaged posts is to be made when like posts are on hand at time of repair.
- Substitutions between three-beam guardrail and concrete barrier wall are not eligible for CSIP consideration.
- On roadways designated for reverse laneing, all downstream ends of guardrail that are not shielded or that are not designed as approach end terminals shall be marked with post-mounted Type 3 Object Markers. Trailing bridge ends and trailing shoulder concrete barrier wall ends shall be marked with Type 3 Object Markers except where there is trailing end guardrail. Object markers to be installed facing reverse laneing traffic. The cost of the object marker shall be included in the cost of the guardrail.

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LAST REVISION 01/01/12	DESCRIPTION REVISION		FDOT DESIGN STANDARDS FY 2012/2013	GUARDRAIL	INDEX NO. 400	SHEET NO. 1
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Index 400 Sheet 1 Note 4

GENERAL NOTES

1. The illustrations for guardrail applications are standard configurations; adjustments are to be made as required by site specific conditions to attain optimum design for function, economy and serviceability.
2. The beginning of guardrail need shall be at the greatest of the upstream distances from the hazard, as determined from Figures 1 and 2, and other application details of this Index.
3. One Panel (i.e., panel length) equals 12'-6". Guardrail shall be constructed with rail elements 12'-6" in length except where 25'-0" elements are called for by this and other standards (indexes) or specifically called for in the plans.

Post spacing shall be 6'-3" except that reduced spacing shall be used for (a) transitions to anchorages at rigid structures such as bridges (See Detail J and Index No. 402) and transitions to retroductive crash cushions, (b) the conditions in Note No. 7 below, (c) special post applications, (d) reduced post spacing required for specific end anchorage assemblies, and, (e) specific spacing called for in the plans.
4. Guardrail mounting height for the W-beam without rub rail and for three-beam is 1'-9" to the center of beam, and for W-beam with rub rail 2'-0" to center of beam. Modified three-beam shall be mounted at a height of 2'-0" to center of beam. The height is critical and shall be attained in all cases; a tolerance of 3" above and 1" below the standard mounting heights is permissible over necessary surface irregularities (e.g., across shoulder gutters, inlets and roadway surface break lines). For guardrail placed on slopes below the shoulder point, there shall be no deviation more than 1" below to 3" above the desired height within any 25 foot section of guardrail.
5. All guardrail panels, end sections and special end shoes shall be lapped in the direction of adjacent traffic.
6. Flared end anchorage assemblies providing 4' offset are the standard end treatments for single face free standing guardrail approach ends. Parallel end anchorage assemblies for guardrail approach end treatments will be constructed only when restraints prevent construction of flared end anchorages.

Guardrail end anchorage assemblies shall be of the type called for in the plans. If the plans call for end anchorage assembly "flared" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved flared assembly provided in this Index or identified on the Qualified Products List (QPL), subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

If the plans call for end anchorage assembly "parallel" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved parallel assembly provided in this Index or identified on the QPL, subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

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When an end treatment is attached to guardrail with Pedestrian Safety Treatment, only end treatment systems with timber posts are to be used.

Existing approved proprietary end anchorage systems are identified on the Qualified Products List (QPL). After January 1, 2013 - manufacturers seeking approval of new proprietary end anchorage systems for inclusion on the QPL, must submit application along with design documentation showing the end anchorage system; is crash tested to Test Level 3 criteria in accordance with the Manual for Assessing Safety Hardware (MASH), is accepted by FHWA for use as a guardrail end anchorage system, and is compatible with FDOT guardrail systems. System approvals will be contingent on FDOT's evaluation of crash test performance results for consistency with FDOT guardrail application and use. If approved, installation drawings signed and sealed by a professional engineer licensed in the State of Florida will be required.
7. At above ground rigid hazards where the face of guardrail is offset from the hazard less than the 4' minimum for standard W-beam, other guardrail configurations with reduced post spacing may be applicable; see General Note No. 11 and the minimum offset table on Sheet 19. For guardrail with post spacing less than 6'-3" the reduced spacing should extend a minimum of one panel in advance of the hazard. When minimum offset cannot be attained safety shape concrete barrier wall shall be used unless other shielding is approved by the Engineer of Record. See Index No. 410 for safety shape concrete barrier walls and typical applications, and the plans for special barrier shapes and applications.
8. In addition to use at roadside hazards or other areas where the Engineer has deemed guardrail necessary, guardrail should be considered on flush shoulder sections where fill slopes are steeper than 1:3 within the clear zone and fill heights are 6' or greater. Curbed sections where fill slopes are steeper than 1:3 and fill heights are 6' or greater within 22' of the traveled way should be evaluated for installation of guardrail. Additional guidance for evaluating the need for guardrail can be found in the Plans Preparation Manual.
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10. The W-beam guardrail system in this index is the standard system to be used on the State Highway System where a Test Level 3 semi-rigid barrier is required.
11. Three-beam guardrail panels shall be used in guardrail transitions to bridge traffic railing barriers, to concrete and certain water filled safety shaped barriers, certain crash cushions and as a continuous barrier when called for in the plans. For additional information on rail attachment, post spacings, nested rails, location of three-beam transition panels and offset block configurations see details elsewhere in this Index, and Index Nos. 402, 410 and 414. The use of three-beam guardrail with standard offset blocks (Test Level 3 semi-rigid system) may be considered where one or more of the conditions listed below or similar conditions are anticipated or exist:
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 - f. Spandrel beam with low deflection needed around unrelocatable structure,
 - g. Accommodating passenger vehicles heavier or larger than the standard passenger car (e.g., passenger vans and small buses).

The modified three-beam guardrail is a Test Level 4 semi-rigid system and may be used where a Test Level 4 guardrail is required.
12. Single face median guardrail for bridges located on divided roadways shall be constructed the same as outer roadway guardrail under the following conditions:
 - a. Wide medians where approach end anchor is located outside of opposing roadway clear zone,
 - b. Medians of uniform width that are occupied by other transportation and joint use facilities,
 - c. Medians of uniform or variable widths with independent vertical alignments not suited to normal median guardrail installations,
 - d. Medians of bifurcated roadways.
13. Straight rail sections may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shop-bent) to fit.
14. Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in lieu of Type II assemblies located in the approach clear zones.
15. Corrugated sheet steel beams, end shoes, end sections and backup plates shall conform to the current requirements of AASHTO M180, Class A, Type II (zinc) coating. All other metallic components, hardware and accessories shall be in conformance with the appropriate current AASHTO requirements.
16. Offset blocks:
 - a. Steel offset blocks other than modified three-beam offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS are tabulated on Sheet 16.
 - b. Plastic offset block installations shall be constructed on guardrail outside of approach end anchorage assemblies or any transition system connecting to a rigid or three-beam barrier.
17. Where necessary to enlarge or add holes to galvanized guardrail, the work will be done by drilling or reaming. Damaged galvanized guardrail will be metalized in accordance with Sections 562 and 971 of the Standard Specifications. No burning of holes will be permitted.
18. For guardrail reflector details see Sheet 17.
19. Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using timber or steel posts. Repair within a run of guardrail with existing concrete posts can be made with either steel, timber, sound salvaged concrete posts; replacement in kind of damaged posts is to be made when like posts are on hand at time of repair.
20. Substitutions between three-beam guardrail and concrete barrier wall are not eligible for CSIP consideration.
21. On roadways designated for reverse laning, all downstream ends of guardrail that are not shielded or that are not designed as approach end terminals shall be marked with post-mounted Type 3 Object Markers. Trailing bridge ends and trailing shoulder concrete barrier wall ends shall be marked with Type 3 Object Markers except where there is trailing end guardrail. Object markers to be installed facing reverse laning traffic. The cost of the object marker shall be included in the cost of the guardrail.

LAST
REVISION
01/01/12

DESCRIPTION



FDOT DESIGN STANDARDS
FY 2012/2013

GUARDRAIL

INDEX
NO.
400

SHEET
NO.
1

Index 400 Sheet 1 Note 4

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Index 400 Sheet 1 Note 4

*a tolerance of 3" above and 1" below the standard mounting heights is permissible over **necessary surface irregularities** (e.g., **across shoulder gutters, inlets and roadway surface break lines**). For guardrail placed on slopes beyond the shoulder point, there shall be no deviation more than 1" below to 3" above the desired height within any 25 foot section of guardrail.*

Index 400 Sheet 1 Note 6

GENERAL NOTES

1. The illustrations for guardrail applications are standard configurations; adjustments are to be made as required by site specific conditions to attain optimum design for function, economy and serviceability.
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7. At above ground rigid hazards where the face of guardrail is offset from the hazard less than the 4' minimum for standard W-beam, other guardrail configurations with reduced post spacing may be applicable; see General Note No. 11 and the minimum offset table on Sheet 10. For guardrail with post spacing less than 6'-3" the reduced spacing should extend a minimum of one panel in advance of the hazard. When minimum offset cannot be attained safety shape concrete barrier wall shall be used unless other shielding is approved by the Engineer of Record. See Index No. 410 for safety shape concrete barrier walls and typical applications, and the plans for special barrier shapes and applications.
8. In addition to use at roadside hazards or other areas where the Engineer has deemed guardrail necessary, guardrail should be considered on flush shoulder sections where fill slopes are steeper than 1:3 within the clear zone and fill heights are 6' or greater. Curbed sections where fill slopes are steeper than 1:3 and fill heights are 6' or greater within 22' of the traveled way should be evaluated for installation of guardrail. Additional guidance for evaluating the need for guardrail can be found in the Plans Preparation Manual.
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 - e. High frequency of repairs to W-beam,
 - f. Spandrel beam with low deflection needed around unrelocatable structure,
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 - c. Medians of uniform or variable widths with independent vertical alignments not suited to normal median guardrail installations,
 - d. Medians of bifurcated roadways.
13. Straight rail sections may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shop-bent) to fit.
14. Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in lieu of Type II assemblies located in the approach clear zones.
15. Corrugated sheet steel beams, end shoes, end sections and backup plates shall conform to the current requirements of AASHTO M180, Class A, Type II (zinc) coating. All other metallic components, hardware and accessories shall be in conformance with the appropriate current AASHTO requirements.
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 - b. Plastic offset block installations shall be constructed on guardrail outside of approach end anchorage assemblies or any transition system connecting to a rigid or three-beam barrier.
17. Where necessary to enlarge or add holes to galvanized guardrail, the work will be done by drilling or reaming. Damaged galvanized guardrail will be metalized in accordance with Sections 562 and 971 of the Standard Specifications. No burning of holes will be permitted.
18. For guardrail reflector details see Sheet 17.
19. Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using timber or steel posts. Repair within a run of guardrail with existing concrete posts can be made with either steel, timber, sound salvaged concrete posts; replacement in kind of damaged posts is to be made when like posts are on hand at time of repair.
20. Substitutions between three-beam guardrail and concrete barrier wall are not eligible for CSIP consideration.
21. On roadways designated for reverse laning, all downstream ends of guardrail that are not shielded or that are not designed as approach end terminals shall be marked with post-mounted Type 3 Object Markers. Trailing bridge ends and trailing shoulder concrete barrier wall ends shall be marked with Type 3 Object Markers except where there is trailing end guardrail. Object markers to be installed facing reverse laning traffic. The cost of the object marker shall be included in the cost of the guardrail.

LAST REVISION 01/01/12	DESCRIPTION REVISION		FDOT DESIGN STANDARDS FY 2012/2013	GUARDRAIL	INDEX NO. 400	SHEET NO. 1
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01/12/2012 12:44:21 PM 12/14/11 12:44:21 PM 12/14/11 12:44:21 PM

Index 400 Sheet 1 Note 6

6. *Flared end anchorage assemblies providing 4' offset are the standard end treatments for single face free standing guardrail approach ends. Parallel end anchorage assemblies for guardrail approach end treatments will be constructed only when restraints prevent construction of flared end anchorages.*

Guardrail end anchorage assemblies shall be of the type called for in the plans. If the plans call for end anchorage assembly "flared" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved flared assembly provided in this Index or identified on the Qualified Products List (QPL), subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

If the plans call for end anchorage assembly "parallel" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved parallel assembly provided in this Index or identified on the QPL, subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

If the plans call for a specific end anchorage assembly, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. Approved substitutions will not be eligible for CSIP consideration.

When an end treatment is attached to guardrail with Pedestrian Safety Treatment, only end treatment systems with timber posts are to be used.

Existing approved proprietary end anchorage systems are identified on the Qualified Products List (QPL). After January 1, 2011 - manufacturers seeking approval of new proprietary end anchorage systems for inclusion on the QPL must submit application along with design documentation showing the end anchorage system; is crash tested to Test Level 3 criteria in accordance with the Manual for Assessing Safety Hardware (MASH), is accepted by FHWA for use as a guardrail end anchorage system, and is compatible with FDOT guardrail systems. System approvals will be contingent on FDOT's evaluation of crash test performance results for consistency with FDOT guardrail application and use. If approved, installation drawings signed and sealed by a professional engineer licensed in the State of Florida will be required.

Index 400 Sheet 1 Note 6

Existing approved proprietary end anchorage systems are identified on the Qualified Products List (QPL).

*After **January 1, 2011** - manufacturers seeking approval of new proprietary end anchorage systems for inclusion on the QPL must submit application along with design documentation showing the end anchorage system;*

Index 400 Sheet 1 Note 6

- *is crash tested to **Test Level 3** criteria in accordance with the Manual for Assessing Safety Hardware (**MASH**),*
- *is accepted by **FHWA** for use as a guardrail end anchorage system,*
- *and is compatible with **FDOT** guardrail systems.*

Index 400 Sheet 1 Note 6

*System approvals will be contingent on FDOT's evaluation of crash test performance results for consistency with FDOT guardrail application and use. If approved, installation drawings **signed and sealed** by a professional engineer licensed in the State of Florida will be required.*

Index 400 Sheet 1 Note 7

GENERAL NOTES

1. The illustrations for guardrail applications are standard configurations; adjustments are to be made as required by site specific conditions to attain optimum design for function, economy and serviceability.
2. The beginning of guardrail need shall be at the greatest of the upstream distances from the hazard, as determined from Figures 1 and 2, and other application details of this Index.
3. One Panel (i.e., panel length) equals 12'-6". Guardrail shall be constructed with rail elements 12'-6" in length except where 25'-0" elements are called for by this and other standards (indexes) or specifically called for in the plans.

Post spacing shall be 6'-3" except that reduced spacing shall be used for (a) transitions to anchorages at rigid structures such as bridges (See Detail J and Index No. 402) and transitions to retroductive crash cushions, (b) the conditions in Note No. 7 below, (c) special post applications, (d) reduced post spacing required for specific end anchorage assemblies, and, (e) specific spacing called for in the plans.
4. Guardrail mounting height for the W-beam without rub rail and for three-beam is 1'-9" to the center of beam, and for W-beam with rub rail 2'-0" to center of beam. Modified three-beam shall be mounted at a height of 2'-0" to center of beam. The height is critical and shall be attained in all cases; a tolerance of 3" above and 1" below the standard mounting heights is permissible over necessary surface irregularities (e.g., across shoulder gutters, inlets and roadway surface break lines). For guardrail placed on slopes beyond the shoulder point, there shall be no deviation more than 1" below to 3" above the desired height within any 25 foot section of guardrail.
5. All guardrail panels, end sections and special end shoes shall be lapped in the direction of adjacent traffic.
6. Flared end anchorage assemblies providing 4' offset are the standard end treatments for single face free standing guardrail approach ends. Parallel end anchorage assemblies for guardrail approach end treatments will be constructed only when restraints prevent construction of flared end anchorages.

Guardrail end anchorage assemblies shall be of the type called for in the plans. If the plans call for end anchorage assembly "flared" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved flared assembly provided in this Index or identified on the Qualified Products List (QPL), subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

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7. At above ground rigid hazards where the face of guardrail is offset from the hazard less than the 4' minimum for standard W-beam other guardrail configurations with reduced post spacing may be applicable; see General Note No. 11 and the minimum offset table on Sheet 10. For guardrail with post spacing less than 6'-3" the reduced spacing should extend a minimum of one panel in advance the hazard. When minimum offset cannot be attained safety shape concrete barrier wall shall be used unless other shielding is approved by the Engineer of Record. See Index No. 410 for safety shape concrete barrier walls and typical applications, and the plans for special barrier shapes and applications.
8. In addition to use at roadside hazards or other areas where the Engineer has deemed guardrail necessary, guardrail should be considered on flush shoulder sections where fill slopes are steeper than 1:3 within the clear zone and fill heights are 6' or greater. Curbed sections where fill slopes are steeper than 1:3 and fill heights are 6' or greater within 22' of the traveled way should be evaluated for installation of guardrail. Additional guidance for evaluating the need for guardrail can be found in the Plans Preparation Manual.
9. The guardrail to bridge connections contained in this Index are for bridges with Test Level 4 traffic railing barriers. For guardrail to concrete barrier wall connections see Index No. 410. For existing bridges receiving retrofit traffic railing barriers see Index No. 402.
10. The W-beam guardrail system in this index is the standard system to be used on the State Highway System where a Test Level 3 semi-rigid barrier is required.
11. Three-beam guardrail panels shall be used in guardrail transitions to bridge traffic railing barriers, to concrete and certain water filled safety shaped barriers, certain crash cushions and as a continuous barrier when called for in the plans. For additional information on rail attachment, post spacings, nested rails, location of three-beam transition panels and offset block configurations see details elsewhere in this Index, and Index Nos. 402, 410 and 414. The use of three-beam guardrail with standard offset blocks (Test Level 3 semi-rigid system) may be considered where one or more of the conditions listed below or similar conditions are anticipated or exist:
 - a. W-beam deflection is marginal,
 - b. W-beam with rub rail considered functionally deficient,
 - c. Vehicle overriding W-beam is probable,
 - d. Drainage will be impeded or blocked by the use of concrete barrier wall (subject to deflection space requirements),
 - e. High frequency of repairs to W-beam,
 - f. Spandrel beam with low deflection needed around unrelocatable structure,
 - g. Accommodating passenger vehicles heavier or larger than the standard passenger car (e.g., passenger vans and small buses).

The modified three-beam guardrail is a Test Level 4 semi-rigid system and may be used where a Test Level 4 guardrail is required.
12. Single face median guardrail for bridges located on divided roadways shall be constructed the same as outer roadway guardrail under the following conditions:
 - a. Wide medians where approach end anchor is located outside of opposing roadway clear zone,
 - b. Medians of uniform width that are occupied by other transportation and joint use facilities,
 - c. Medians of uniform or variable widths with independent vertical alignments not suited to normal median guardrail installations,
 - d. Medians of bifurcated roadways.
13. Straight rail sections may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shop-bent) to fit.
14. Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in lieu of Type II assemblies located in the approach clear zones.
15. Corrugated sheet steel beams, end shoes, end sections and backup plates shall conform to the current requirements of AASHTO M180, Class A, Type II (zinc) coating. All other metallic components, hardware and accessories shall be in conformance with the appropriate current AASHTO requirements.
16. Offset blocks:
 - a. Steel offset blocks other than modified three-beam offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS are tabulated on Sheet 16.
 - b. Plastic offset block installations shall be constructed on guardrail outside of approach end anchorage assemblies or any transition system connecting to a rigid or three-beam barrier.
17. Where necessary to enlarge or add holes to galvanized guardrail, the work will be done by drilling or reaming. Damaged galvanized guardrail will be metalized in accordance with Sections 562 and 971 of the Standard Specifications. No burning of holes will be permitted.
18. For guardrail reflector details see Sheet 17.
19. Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using timber or steel posts. Repair within a run of guardrail with existing concrete posts can be made with either steel, timber, sound salvaged concrete posts; replacement in kind of damaged posts is to be made when like posts are on hand at time of repair.
20. Substitutions between three-beam guardrail and concrete barrier wall are not eligible for CSIP consideration.
21. On roadways designated for reverse laning, all downstream ends of guardrail that are not shielded or that are not designed as approach end terminals shall be marked with post-mounted Type 3 Object Markers. Trailing bridge ends and trailing shoulder concrete barrier wall ends shall be marked with Type 3 Object Markers except where there is trailing end guardrail. Object markers to be installed facing reverse laning traffic. The cost of the object marker shall be included in the cost of the guardrail.

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Index 400 Sheet 1 Note 7

- 7. At above ground rigid hazards where the face of guardrail is offset from the hazard less than the 4' minimum for standard W-beam other guardrail configurations with reduced post spacing may be applicable; see General Note No. 11 and the minimum offset table on Sheet 19. For guardrail with post spacing less than 6'-3" the reduced spacing should extend a minimum of one panel in advance of the hazard.*

Index 400 Sheet 1 Note 7

When minimum offset cannot be attained safety shape concrete barrier wall shall be used unless other shielding is approved by the Engineer of Record. See Index No. 410 for safety shape concrete barrier walls and typical applications, and the plans for special barrier shapes and applications.

Index 400 Sheet 1 Note 16

GENERAL NOTES

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 13. Straight rail sections may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shop-bent) to fit.
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 - b. Plastic offset block installations shall be constructed on guardrail outside of approach end anchorage assemblies or any transition system connecting to a rigid or three-beam barrier.
 17. It may be necessary to use galvanized steel bolts to prevent galvanic corrosion with the zinc coating by utilizing galvanized galvanized guardrail will be metalized in accordance with Sections 562 and 971 of the Standard Specifications. No burning of holes will be permitted.
 18. For guardrail reflector details see Sheet 17.
 19. Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using timber or steel posts. Repair within a run of guardrail with existing concrete posts can be made with either steel, timber, sound salvaged concrete posts; replacement in kind of damaged posts is to be made when like posts are on hand at time of repair.
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LAST REVISION	DESCRIPTION
01/01/12	

REVISION	DESCRIPTION



FDOT DESIGN STANDARDS
FY 2012/2013

GUARDRAIL

INDEX NO.	SHEET NO.
400	1

Index 400 Sheet 1 Note 16

16. *Offset blocks:*

- a. *Steel offset blocks other than modified thrie-beam offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. **PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS** are tabulated on Sheet 16.*
- b. *Plastic offset block installations shall be constructed on guardrail **outside of approach end anchorage assemblies** or any **transition system** connecting to a rigid or thrie-beam barrier.*

DESIGN STANDARDS REVISIONS

- *What are Design Standards Revisions?*
 - *Revisions to the Design Standards between regularly scheduled releases.*
- *When do you expect them?*
 - *On an “as needed” to Effect Changes of Immediate Concern with Implementation via Design Bulletin.*
- *How do you incorporate them?*
 - *By including a Reference on the Contract Plans Lead Key Sheet.*

Roadway Design Bulletin 12-06

Design Standards Revision R1301



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD
SECRETARY

Mail Station 32

ROADWAY DESIGN BULLETIN 12-06 DESIGN STANDARDS REVISIONS R1301

DATE: March 12, 2012

TO: District Design Engineers, Plans Preparation Manual Holders

FROM: David C. O'Hagan, PE, State Roadway Design Engineer

COPIES: David Sadler, Tim Lattner, Robert Robertson, Duane Brautigam, Mark Wilson, Chris Richter, FHWA

SUBJECT: Design Standards Revisions (R1301), Dated July 1, 2012

The Design Standards Revisions to the FY 2012/2013 Design Standards eBooklet, Effective Date July 1, 2012, have been posted on the Roadway Design Office web site.

The Design Standards Revisions (R1301) includes a listing of all revisions incorporated into the affected Design Standard Indexes.

All plans beginning with the July 1, 2012 letting shall include a reference to "APPLICABLE DESIGN STANDARDS REVISIONS: 07-01-12" on the lower left corner of the Key Sheet below the Governing Specifications and Standards note, and above the Revisions area. For more information please see the Plans Preparation Manual, Volume II, Section 3.8 and Exhibit KS-1.

The July 1, 2012, Design Standards Revisions (R1301) includes the following Indexes:

Index No. 400 (Sheets 13, 17, 18, 22 & 26), GUARDRAIL - Dated 01/01/12:

(Sheet 13)

- Deleted "Guardrail Transition Cost" note from the ELEVATION view detail,

(Sheets 17)

- Revised Note 1 to better clarify the criteria associated with implementing PEDESTRIAN SAFETY TREATMENTS,
- Deleted cost information note (Note 3);

March 12, 2012
Design Bulletin 12-06
Page 2 of 2

(Sheets 18)

- Revised "See Note 1" to "See PEDESTRIAN SAFETY TREATMENTS" on PLAN view detail,
- Deleted Note 1, renamed Note 2 to Note 1 and renamed Note 3 to Note 2,
- Revised the renumbered Note 2 for clarity,
- Deleted dimensions based on proprietary products for SECTION BB and SECTION CC;

(Sheet 22)

- Revised the "Class 1" concrete label to read "Class NS" concrete on SECTION detail,

(Sheet 26)

- Deleted last sentence from Note 1 of the LATERAL PLACEMENT ON SLOPES table.

Index No. 414 (Sheet 1), Type K Temporary Concrete Barrier System - Dated 01/01/12:

- Added note for Alternate Design requirements for inclusion on QPL.

Index No. 619 (Sheets 1 & 2), Multilane, Mobile Operations Work on Shoulder, Work Within Travel Way - Dated 01/01/12:

(Sheet 1)

- Added New Note 2, Notes 3, 4, 5 and 8 revised. Revised detail for Work on Shoulder and Work Within Travel Lane.

(Sheet 2)

- Deleted detail for Work Within Travel Lane, Outside or Inside Lane.
- Revised detail for Work Within Travel Lane, Center Lane and detail for Work Within Travel Lane.

The revised Index Drawings and Design Standards Revisions can be accessed at the following web site:

<http://www.dot.state.fl.us/rddesign/DesignStandards/Standards.shtm>

For questions, comments and/or clarification concerns relative to:

- Index 400 – Contact John Mauthner, (850) 414-4334,
- Index 414 – Contact Ezzel Benghuzzi, (850) 414-4352,
- Index 619 – Contact Ezzel Benghuzzi, (850) 414-4352.

Design Standards Revision R1301

The Design Standards Revisions to the FY 2012/2013 Design Standards eBooklet, Effective Date **July 1, 2012**, have been posted on the Roadway Design Office web site.

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Design Standards Revision R1301

When Applicable – “All plans beginning with the *July 1, 2012* letting shall include a reference to “APPLICABLE DESIGN STANDARDS REVISIONS: **07-01-12**” on the lower left corner of the Key Sheet below the Governing Specifications and Standards note, and above the Revisions area. For more information please see the Plans Preparation Manual, Volume II, Section 3.8 and *Exhibit KS-1.*”

Design Standards Revision R1301

Index No. 400 (Sheets 13, 17, 18, 22 & 26),

GUARDRAIL - Dated 01/01/12:

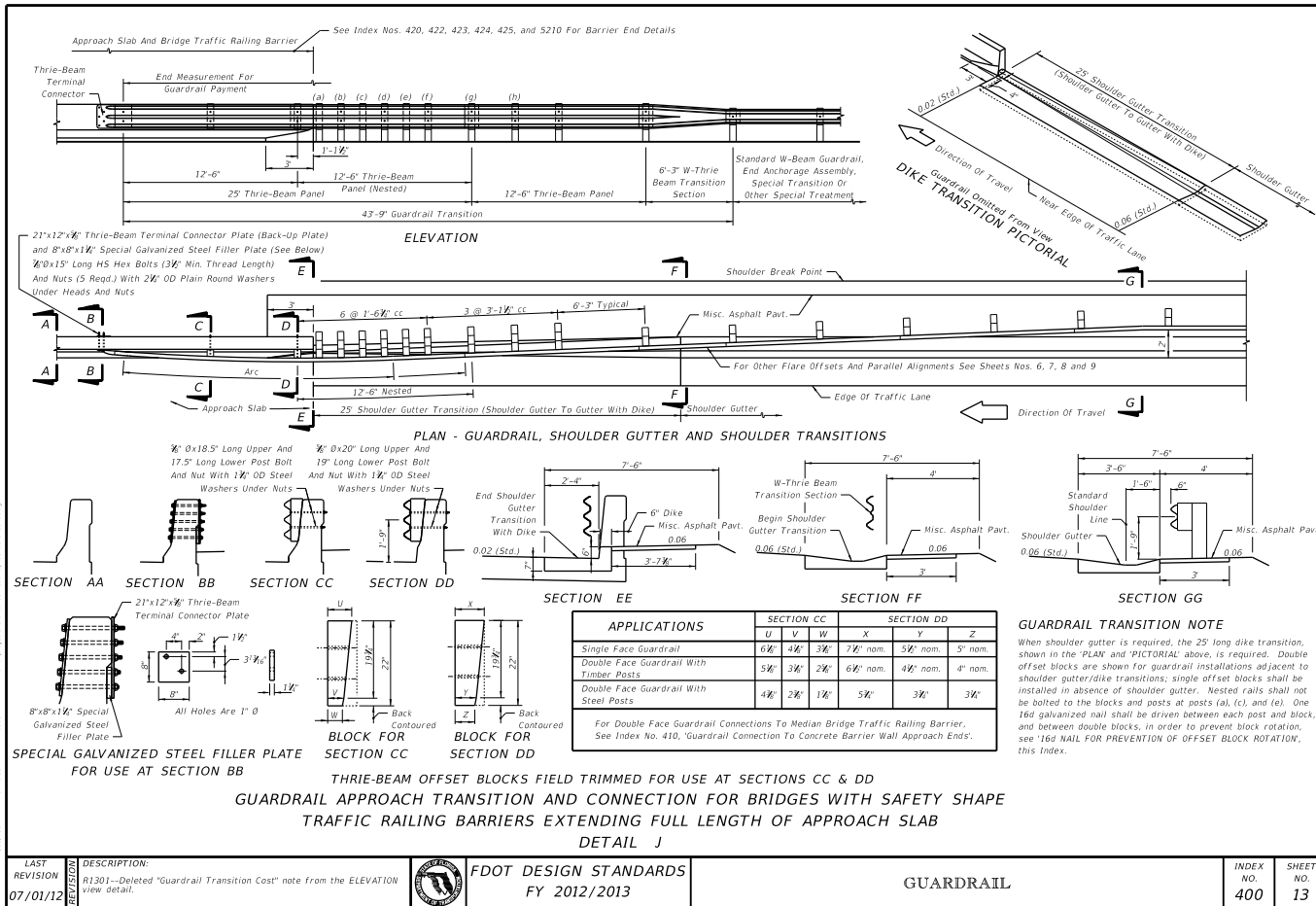
(Sheet 13)

- Deleted “Guardrail Transition Cost” note from the ELEVATION view detail,

Based on Revisions to:

- ❖ **Specification 536 – Guardrail,**
- ❖ **Subarticle 536-6 Method of Measurement,**
- ❖ **Subarticle 536-7 Basis of Payment.**

Index 400 Sheet 13



LAST REVISION 07/01/12

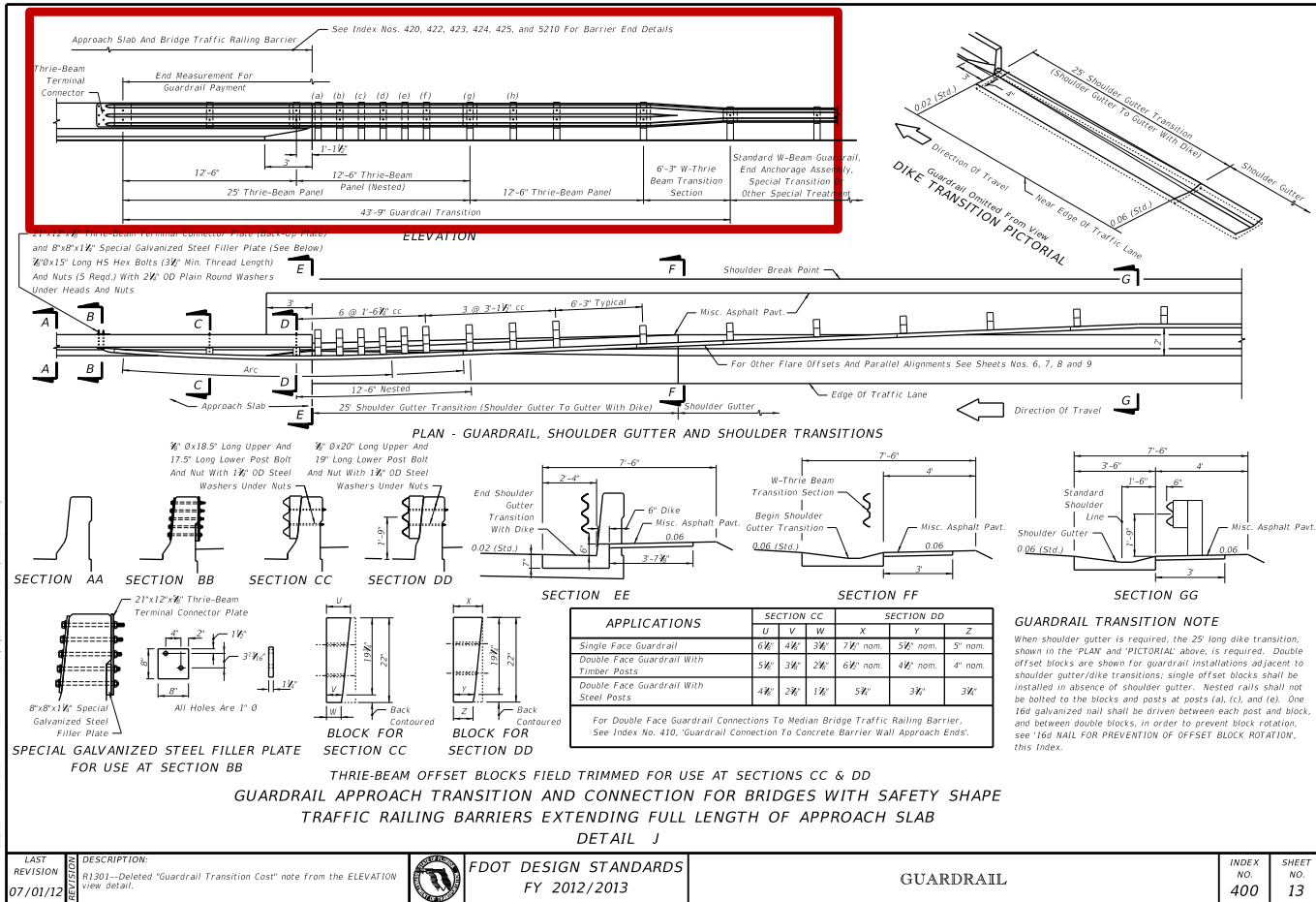
DESCRIPTION: R1301-Deleted "Guardrail Transition Cost" note from the ELEVATION view detail.

FDOT DESIGN STANDARDS FY 2012/2013

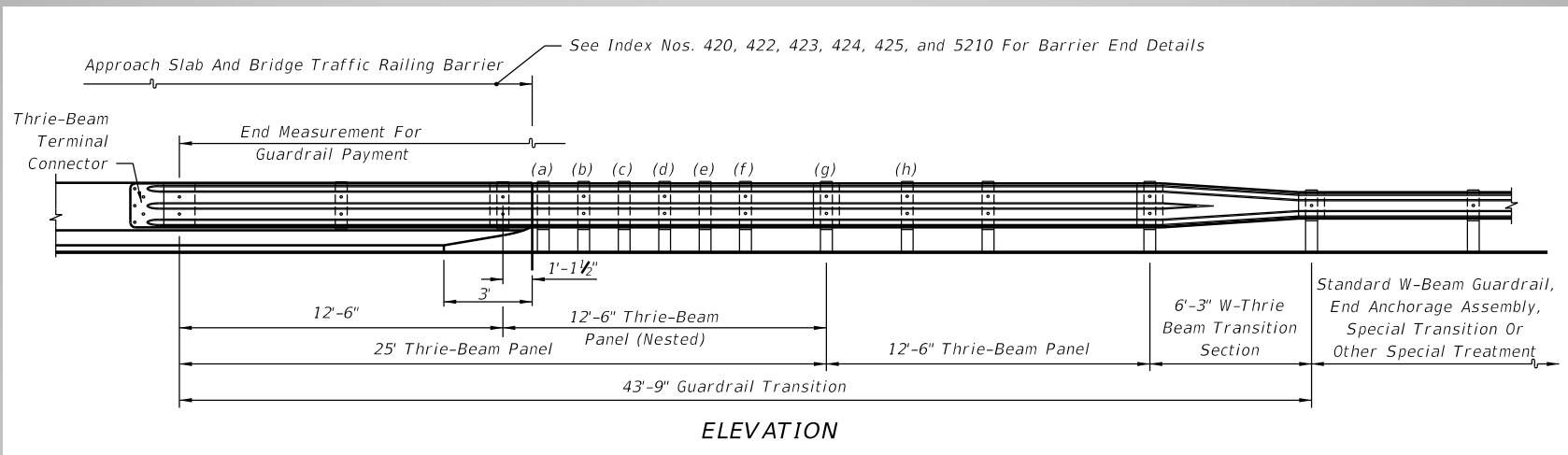
GUARDRAIL

INDEX NO. 400 SHEET NO. 13

Index 400 Sheet 13



Index 400 Sheet 13

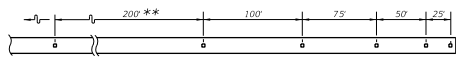


Design Standards Revision R1301

(Sheet 17)

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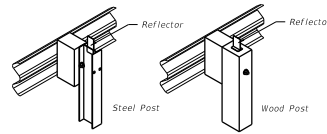
Index 400 Sheet 17



Note: Adjustment in spacing may be required to fit exact guardrail lengths as directed by the Engineer. For minimum installations (length 62.5) provide one reflector at each end and one at the approximate center.

**For curves greater than 2" the spacing shall be reduced to 100' increments through the curve.

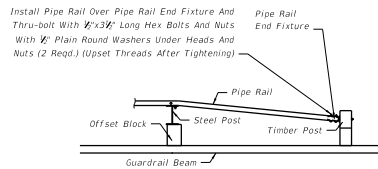
REFLECTOR ELEMENT SPACING



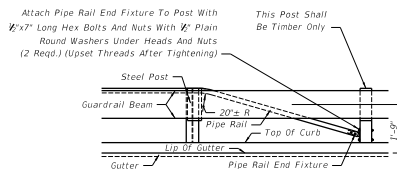
PICTORIAL VIEW REFLECTOR MOUNTING
REFLECTORS-DETAIL M

REFLECTOR NOTES

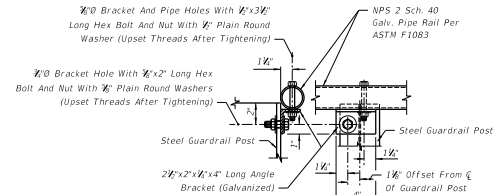
1. Reflectors shall conform to Section 993 of the Standard Specifications.
2. Reflector color (white or yellow) shall conform to the color of the near lane edge line.
3. Reflectors installed on median guardrail shall have retro-reflective sheeting on both sides of the reflector.
4. The cost for reflectors shall be included in the contract unit price for Guardrail.



PLAN



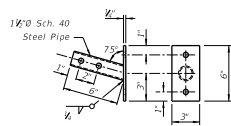
ELEVATION



VIEW A VIEW B
PIPE RAIL MOUNTING

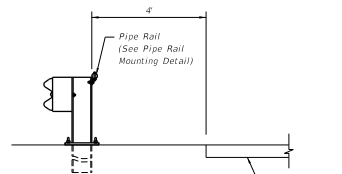
NOTES

1. Pipe Rail is required on steel guardrail posts when the front of pedestrian ways and bikeways are located 4' or less from behind the back of the post. Pipe rail shall not extend beyond the last post of the approach end anchorage assembly. Begin and end the Pipe Rail in accordance with the PIPE RAIL END FIXTURE detail.
2. When guardrail with timber posts are located with the back of post 4' or less from the near front edge of the pedestrian way or bikeway, the bolt ends will require one of the following treatments:
 - a. Trim back flush with the face of nut and metalize or
 - b. Use post bolts 15" in length with washers and nuts counter sunk into sinks 1" to 1 1/2" deep or
 - c. Use post bolts 15" in length with sleeve nuts and washers.

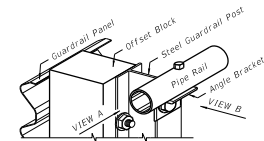


PIPE RAIL END FIXTURE

All Holes Shall Be 3/8" Galvanize After Drilling And Welding



STEEL POST SECTION



PICTORIAL

FOR LOCATIONS USED BY PEDESTRIANS OR CYCLISTS
PEDESTRIAN SAFETY TREATMENTS

LAST REVISION	DESCRIPTION
07/01/12	R1301-Revised Note 1 to better clarify the criteria associated with implementing PEDESTRIAN SAFETY TREATMENTS, and deleted cost information note (Note 3).



FDOT DESIGN STANDARDS
FY 2012/2013

GUARDRAIL

INDEX NO.	SHEET NO.
400	17

Index 400 Sheet 17

NOTES

- 1. Pipe Rail is required on steel guardrail posts when the front of pedestrian ways and bikeways are located 4' or less from behind the back of the post. Pipe rail shall not extend beyond the last post of the approach end anchorage assembly. Begin and end the Pipe Rail in accordance with the PIPE RAIL END FIXTURE detail.*

Refer to Sheet 1, GENERAL NOTE 6 for guardrail end treatment requirements.

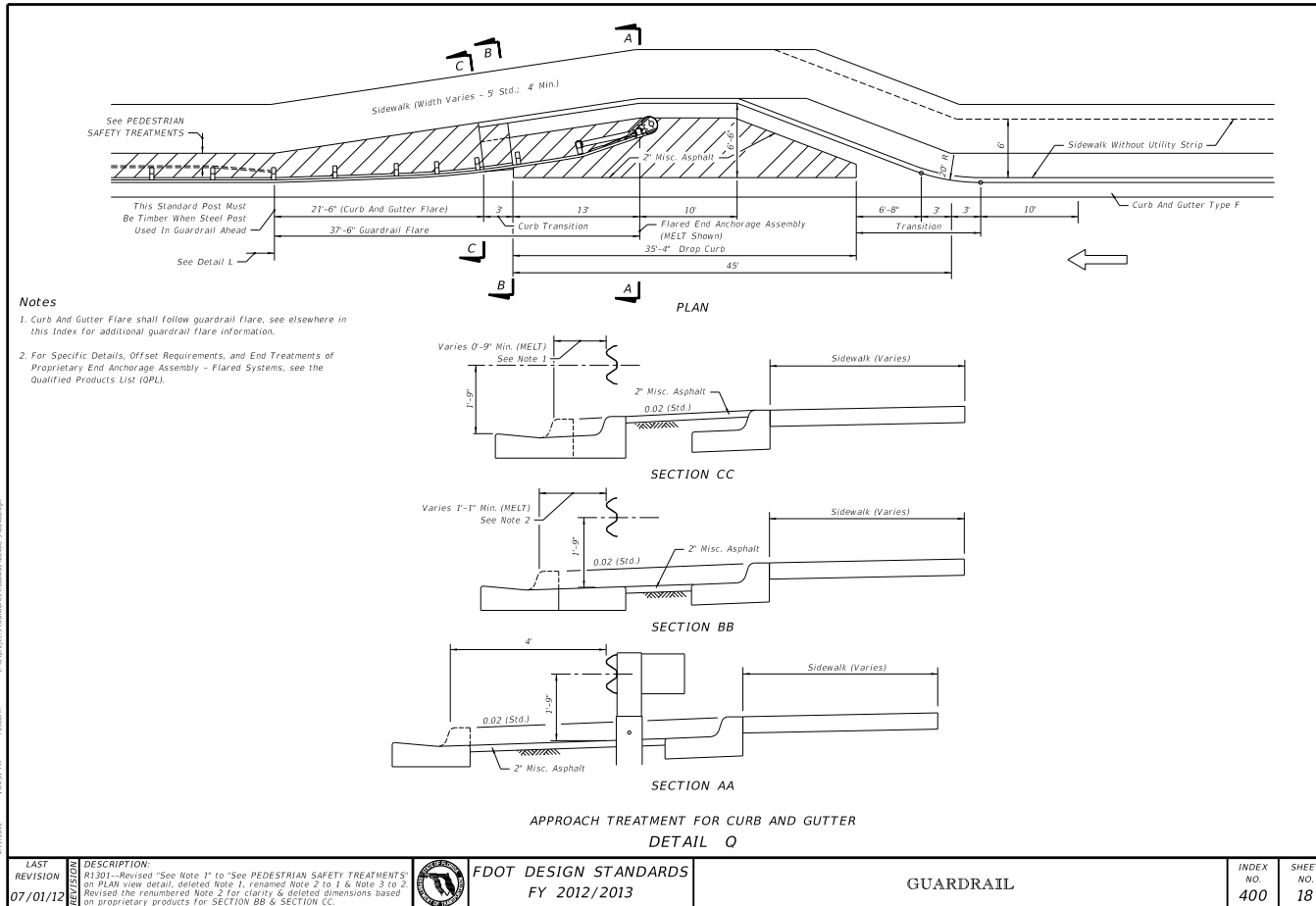
- 2. When guardrail with timber posts are located with the back of post 4' or less from the near front edge of the pedestrian way or bikeway, the bolt ends will require one of the following treatments:*
 - a. Trim back flush with the face of nut and metalize or*
 - b. Use post bolts 15" in length with washers and nuts counter sunk into sinks 1" to 1½" deep or*
 - c. Use post bolts 15" in length with sleeve nuts and washers.*

Design Standards Revision R1301

(Sheet 18)

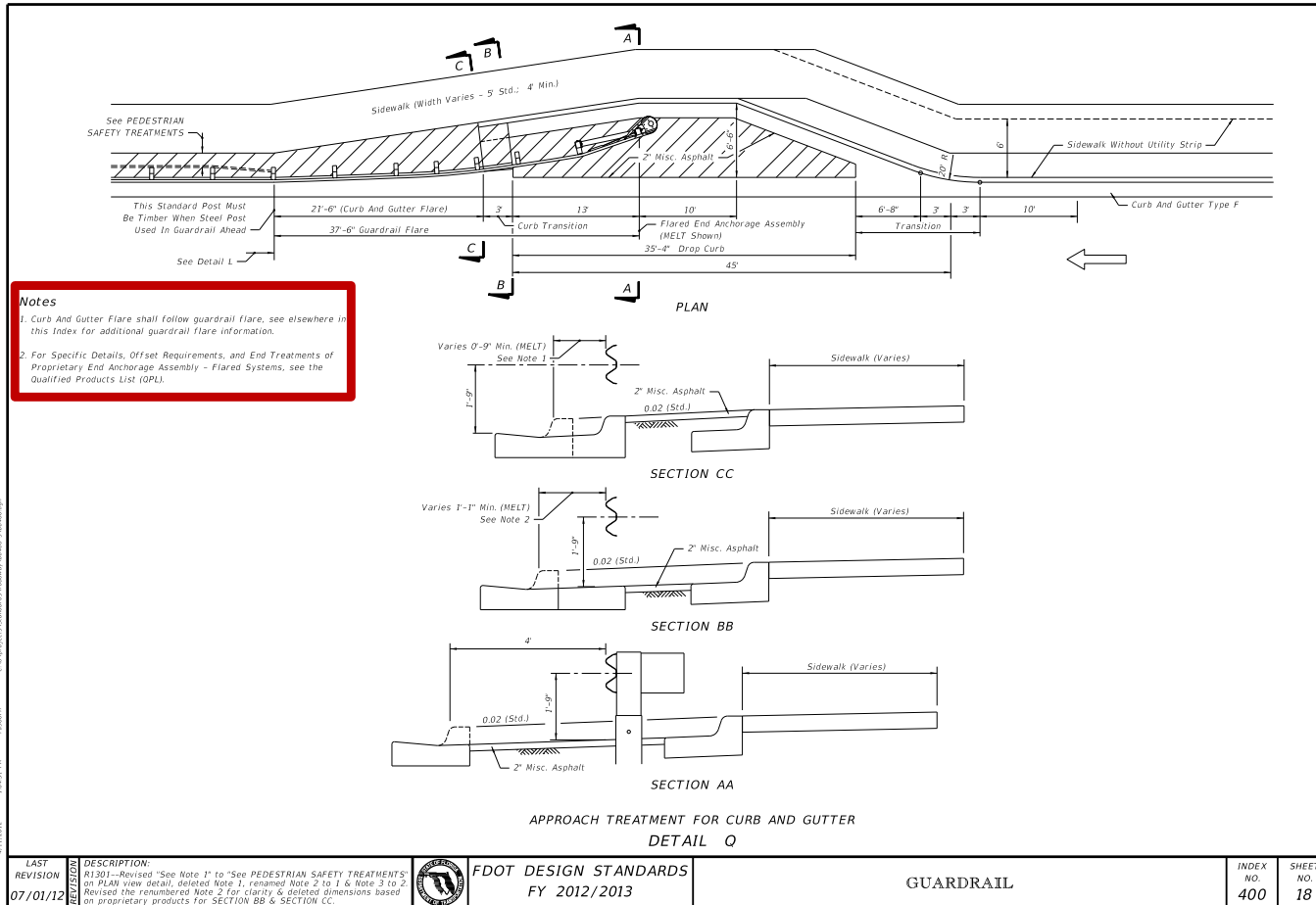
- Revised "See Note 1" to "See PEDESTRIAN SAFETY TREATMENTS" on PLAN view detail,
- Deleted Note 1, renamed Note 2 to Note 1 and renamed Note 3 to Note 2,
- Revised the renumbered Note 2 for clarity,
- Deleted dimensions based on proprietary products for SECTION BB and SECTION CC;

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Index 400 Sheet 18



07/01/12 1:54:27 PM 11/20/12 1:54:27 PM 11/20/12 1:54:27 PM

LAST REVISION	DESCRIPTION:	 FDOT DESIGN STANDARDS FY 2012/2013	GUARDRAIL	INDEX NO.	SHEET NO.
07/01/12	R1301--Revised "See Note 1" to "See PEDESTRIAN SAFETY TREATMENTS" on PLAN view detail, deleted Note 1, renamed Note 2 to 1 & Note 3 to 2. Revised the remaining Note 2 for clarity & deleted dimensions based on proprietary products for SECTION BB & SECTION CC.			400	18

Index 400 Sheet 18

Notes

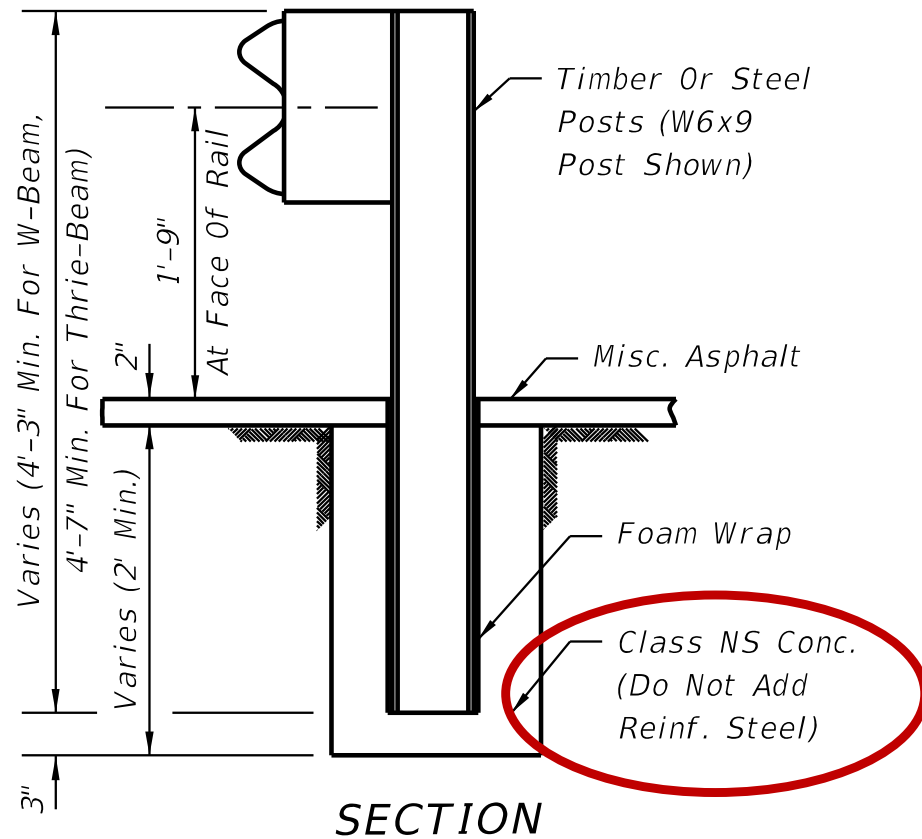
- 1. Curb And Gutter Flare shall follow guardrail flare, see elsewhere in this Index for additional guardrail flare information.*
- 2. For Specific Details, Offset Requirements, and End Treatments of Proprietary End Anchorage Assembly - Flared Systems, see the Qualified Products List (QPL).*

Design Standards Revision R1301

(Sheet 22)

- Revised the "Class I " concrete label to read "Class NS" concrete on SECTION detail

Index 400 Sheet 26

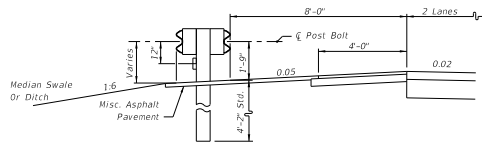
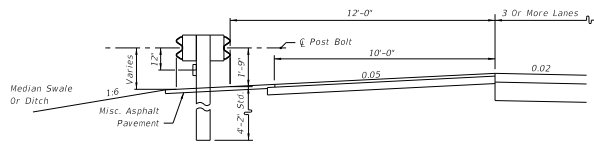


Design Standards Revision R13-01

(Sheet 26)

- Deleted last sentence from Note 1 of the **LATERAL PLACEMENT ON SLOPES** table.

Index 400 Sheet 26



Notes:

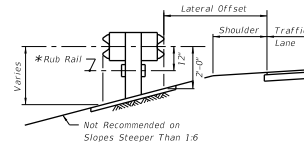
1. Typical placement shown. May be constructed at other locations as called for in the plans.
2. Rub Rail is required on the median side or ditch side of the barrier.

MOUNTING HEIGHT FOR DOUBLE FACED GUARDRAIL ON MEDIAN SHOULDERS (FREEWAYS)

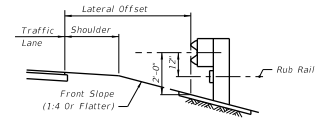
LATERAL PLACEMENT ON SLOPES (FROM EDGE OF NEAR TRAFFIC LANE) ¹			
Slope	Standard Guardrail ²	Guardrail Not Recommended	Guardrail With Rub Rail ³
1:4	to 13'	14' to 27'	28' to 45'
1:5	to 14'	15' to 25'	26' to 45'
1:6	to 16'	17' to 22'	23' to 45'
1:7	to 20'	21' to 24'	25' to 45'
1:8	to 25'		26' to 45'
1:9	to 26'		27' to 45'
1:10	to 27'		28' to 45'

Notes:

1. For shoulders less than 12' in width the tabulated values will be reduced by the difference between 12' and the shoulder width. Placement of guardrail on front slopes steeper than 1:4 not recommended.
2. Standard guardrail; 1'-9" to $\frac{1}{4}$ post bolt. Rub Rail is required on the median side when double face guardrail is used.
3. Guardrail with Rub Rail; 2'-0" to $\frac{1}{4}$ post bolt.



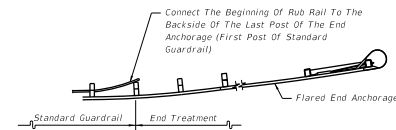
GUARDRAIL ON MEDIAN SLOPES



GUARDRAIL ON OUTSIDE SLOPES

* C6x8.2, Plates And Fasteners or Bent Plate And Fasteners In Accordance With Standards RLR01 And RER01 OF AASHTO-AGC-ARTBA "A Guide To Standardized Highway Barrier Hardware"

GUARDRAIL ON SLOPES



RUB RAIL TERMINATION

LAST REVISION 07/01/12

DESCRIPTION: R1301--Deleted last sentence from Note 1 of the LATERAL PLACEMENT ON SLOPES table.

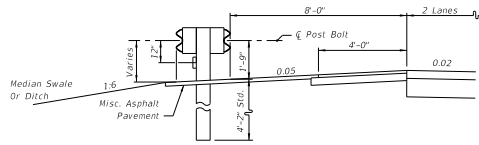
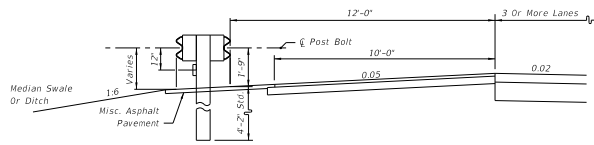


FDOT DESIGN STANDARDS
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GUARDRAIL

INDEX NO. 400
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Notes:

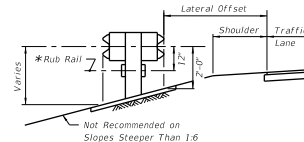
1. Typical placement shown. May be constructed at other locations as called for in the plans.
2. Rub Rail is required on the median side or ditch side of the barrier.

MOUNTING HEIGHT FOR DOUBLE FACED GUARDRAIL ON MEDIAN SHOULDERS (FREEWAYS)

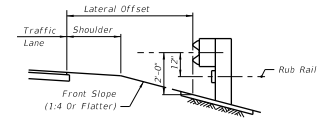
LATERAL PLACEMENT ON SLOPES (FROM EDGE OF NEAR TRAFFIC LANE) ¹			
Slope	Standard Guardrail ²	Guardrail Not Recommended	Guardrail With Rub Rail ³
1:4	to 13'	14' to 27'	28' to 45'
1:5	to 14'	15' to 25'	26' to 45'
1:6	to 16'	17' to 22'	23' to 45'
1:7	to 20'	21' to 24'	25' to 45'
1:8	to 25'		26' to 45'
1:9	to 26'		27' to 45'
1:10	to 27'		28' to 45'

Notes:

1. For shoulders less than 12' in width the tabulated values will be reduced by the difference between 12' and the shoulder width. Placement of guardrail on front slopes steeper than 1:4 not recommended.
2. Standard guardrail; 1'-9" to $\frac{1}{2}$ " post bolt. Rub Rail is required on the median side when double face guardrail is used.
3. Guardrail with Rub Rail; 2'-0" to $\frac{1}{2}$ " post bolt.



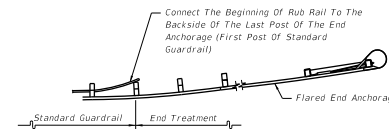
GUARDRAIL ON MEDIAN SLOPES



GUARDRAIL ON OUTSIDE SLOPES

* C6x8.2, Plates And Fasteners or Bent Plate And Fasteners In Accordance With Standards RLR01 And RER01 Of AASHTO-AGC-ARTBA "A Guide To Standardized Highway Barrier Hardware"

GUARDRAIL ON SLOPES



RUB RAIL TERMINATION

LAST REVISION 07/01/12

DESCRIPTION: R1301--Deleted last sentence from Note 1 of the LATERAL PLACEMENT ON SLOPES table.



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GUARDRAIL

INDEX NO. 400
SHEET NO. 26

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Index 400 Sheet 26

Notes:

- 1. For shoulders less than 12' in width the tabulated values will be reduced by the difference between 12' and the shoulder width. Placement of guardrail on front slopes steeper than 1:4 not recommended.*
- 2. Standard guardrail; 1'-9" to CL post bolt. Rub Rail is required on the median side when double face guardrail is used.*
- 3. Guardrail with Rub Rail; 2'-0" to CL post bolt.*

Pedestrian Safety Treatment and Roadway Rub Rail

SUMMARY OF GUARDRAIL																													
LOCATION		GUARDRAIL (LF)						BRIDGE ANCHORAGE ASSEMBLIES (EA)		END ANCHORAGE ASSEMBLIES (EA)						LOCATION		PEDESTRIAN SAFETY TREATMENT		ROADWAY				REMARKS	FIELD BOOK REFERENCE				
STATION	SIDE	ROADWAY						NEW CONSTRUCTION OR RETROFIT	NEW CONSTRUCTION OR RETROFIT						STATION	SIDE	PIPE RAIL (LF)		RUB RAIL (LF)										
		ROADWAY		DOUBLE FACE		MOD. THRIE BEAM DBL FACE			FLARED		PARALLEL		TYPE II				TYPE C		SGL	DBL	SGL		DBL						
		P	F	P	F	P	F		P	F	P	F	P	F			P	F			P	F	P			F			
FROM																													
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FROM																													
TO																													
FROM																													
TO																													
TOTAL																													

Specification 536-6

Method of Measurement

536-6.4 Bridge Anchorage Assemblies: The quantity to be paid for will be the number of each, constructed, in place and accepted.

536-6.5 Guardrail Anchorage (Concrete Barrier Wall): The quantity to be paid for will be the number of each, constructed, in place and accepted.

Specification 536-6

Method of Measurement

536-6.9 Other Rail:

536-6.9.1 Rub Rail: The quantity to be paid for will be the plan quantity, in feet, constructed, in place and accepted.

536-6.9.2 Pipe Rail: The quantity to be paid for will be the plan quantity, in feet, constructed, in place and accepted.

Specification 536-7

Basis of Payment

536-7.4 Bridge Anchorage Assemblies: Price and payment will include furnishing and installing the special End Shoes, Wood Blocks or Retrofit Wing Posts, Concrete Anchor Posts, Thrie-Beam Terminal Connectors, Back Up Plates, Filler Plates, and necessary hardware.

536-7.5 Guardrail Anchorage (Concrete Barrier Wall): Price and payment will include installing connections to concrete barrier walls, as shown on the Design Standards, Index Nos. 400 and 410.

Specification 536-7

Basis of Payment

536-7.9 Other Rail:

536-7.9.1 Rub Rail: Price and payment will include all components specified on the plans and Design Standards, Index No. 400.

536-7.9.2 Pipe Rail: Price and payment will include all components specified on the plans and Design Standards, Index No. 400.

Specification 536-7

Basis of Payment

536-7.10 Payment Items:

Payment will be made under:

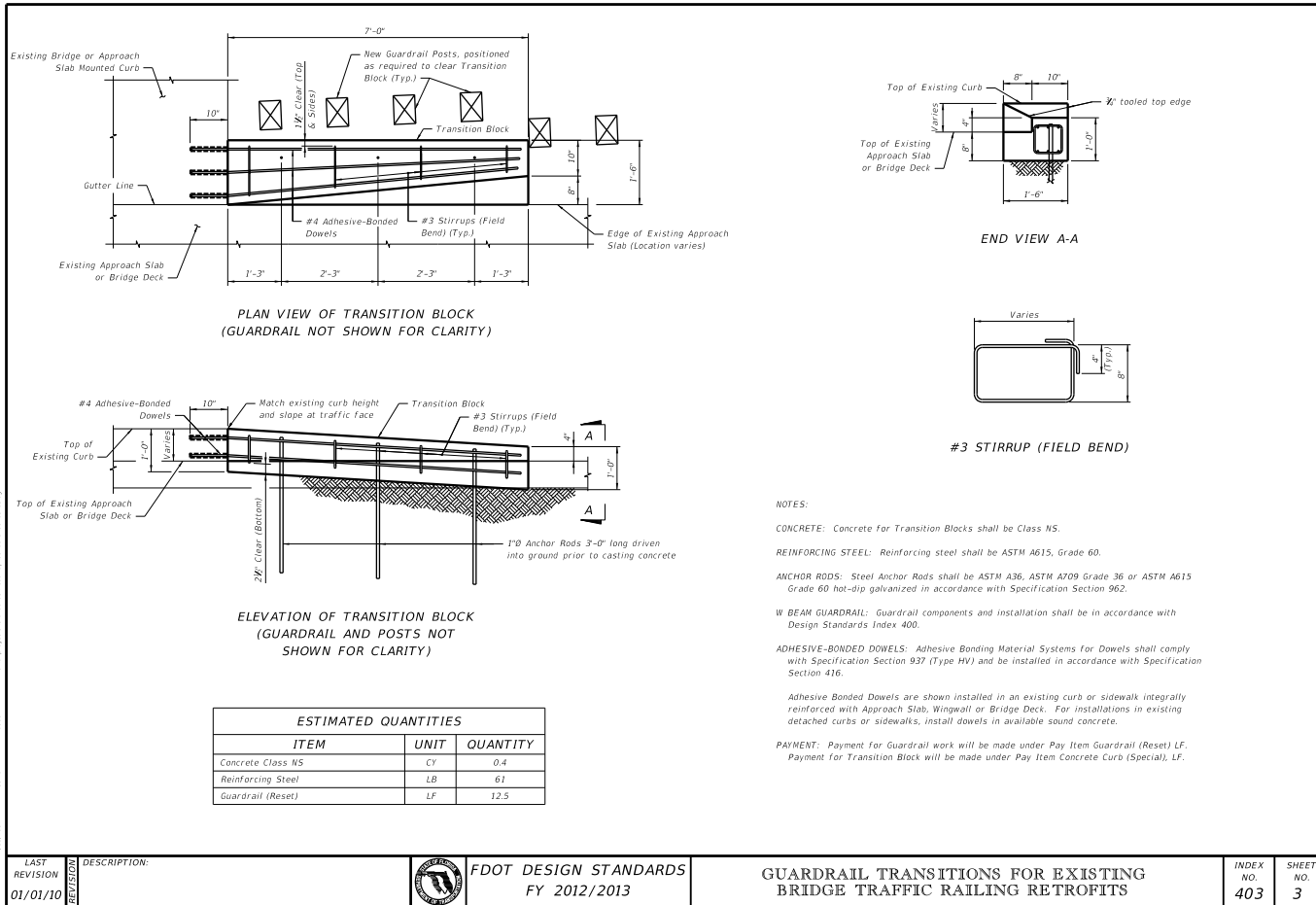
Item No. 536- 5-	Rub Rail - per foot.
Item No. 536- 6-	Pipe Rail - per foot.
Item No. 536- 8-	Bridge Anchorage Assemblies - each.
Item No. 536- 82-	Guardrail Anchorage (Concrete Barrier Wall) - each.

Basis of Estimates

Pay Items

- 536-5-A Guardrail – Rub Rail, LF**
A = Type
1 (Single Sided)
2 (Double Sided)
- 536-6 Guardrail – Pipe Rail, LF**
- 536-8 Guardrail Bridge Anchorage
Assembly, EA**
- 536-82 Guardrail Anchorage
(Concrete Barrier Wall), EA**

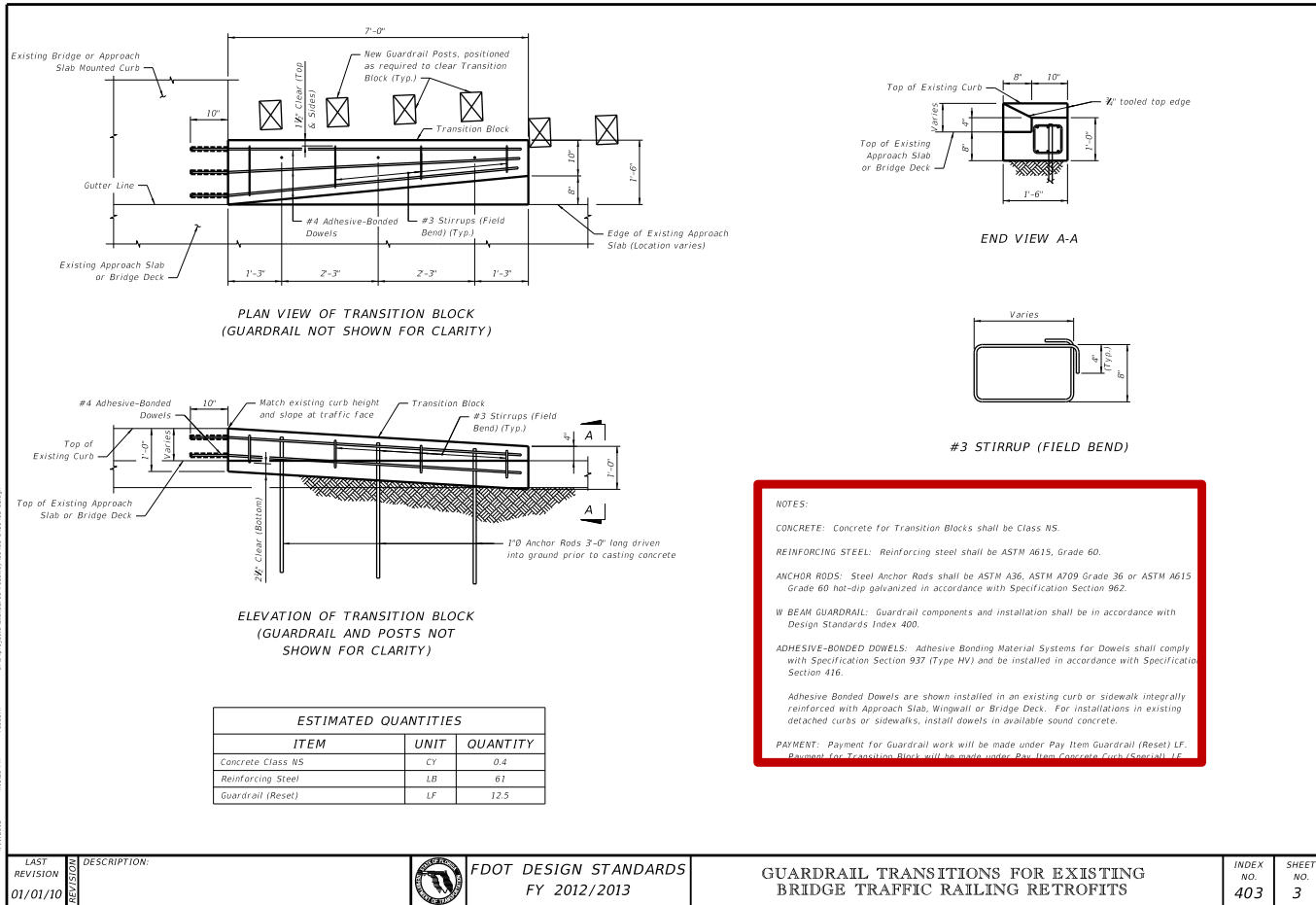
Index 403 Sheet 3



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LAST REVISION 01/01/10	DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	GUARDRAIL TRANSITIONS FOR EXISTING BRIDGE TRAFFIC RAILING RETROFITS	INDEX NO. 403	SHEET NO. 3

Index 403 Sheet 3



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Index 403 Sheet 3

NOTES:

CONCRETE: Concrete for Transition Blocks shall be Class NS.

REINFORCING STEEL: Reinforcing steel shall be ASTM A615, Grade 60.

ANCHOR RODS: Steel Anchor Rods shall be ASTM A36, ASTM A709 Grade 36 or ASTM A615 Grade 60 hot-dip galvanized in accordance with Specification Section 962.

W BEAM GUARDRAIL: Guardrail components and installation shall be in accordance with Design Standards Index 400.

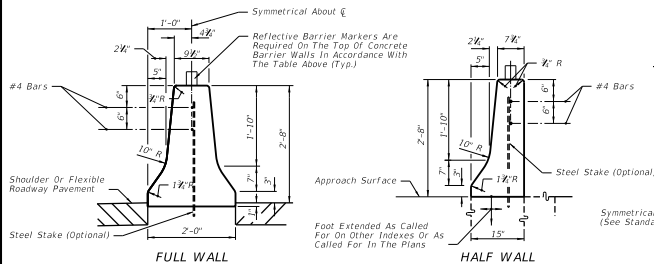
ADHESIVE-BONDED DOWELS: Adhesive Bonding Material Systems for Dowels shall comply with Specification Section 937 (Type HV) and be installed in accordance with Specification Section 416.

Adhesive Bonded Dowels are shown installed in an existing curb or sidewalk integrally reinforced with Approach Slab, Wingwall or Bridge Deck. For installations in existing detached curbs or sidewalks, install dowels in available sound concrete.

PAYMENT: Payment for Guardrail work will be made under Pay Item Guardrail (Reset) LF. Payment for Transition Block will be made under Pay Item Concrete Curb (Special), LF.

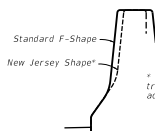
Index 410 Sheet 1

REFLECTIVE BARRIER MARKER SPACING ON WALL		REMARKS
Distance-Edge of Travel Lane to Barrier Wall (ft)	Spacing (Ft.)	
4 to 8	40'	1. Reflectors shall conform to Section 993 of the Standard Specifications. 2. Reflector color (white or yellow) shall conform to the color of the near edge line. 3. The cost for reflectors shall be included in the contract unit price for barrier wall.
8 to 10	60'	
> than 10	none required	



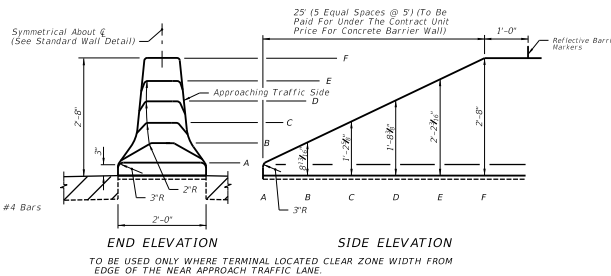
For concrete barrier wall details at piers, highway lighting and guardrail connections, see other sheets of this Index.
Standard barrier to be paid for under the contract unit price for Median Concrete Barrier Wall, LF.

STANDARD BARRIER WALL SECTIONS



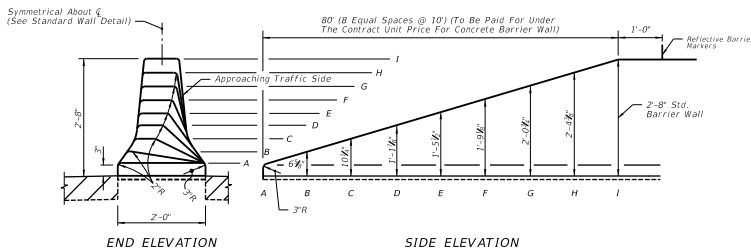
WALL FACE SAFETY SHAPES

* Where standard F-Shape walls abut existing NJ Shape walls, face transitions of not less than 5' in length shall be constructed at the adjoining end of the F-Shape wall.



TO BE USED ONLY WHERE TERMINAL LOCATED CLEAR ZONE WIDTH FROM EDGE OF THE NEAR APPROACH TRAFFIC LANE.

CONCRETE BARRIER WALL TERMINAL DETAIL II



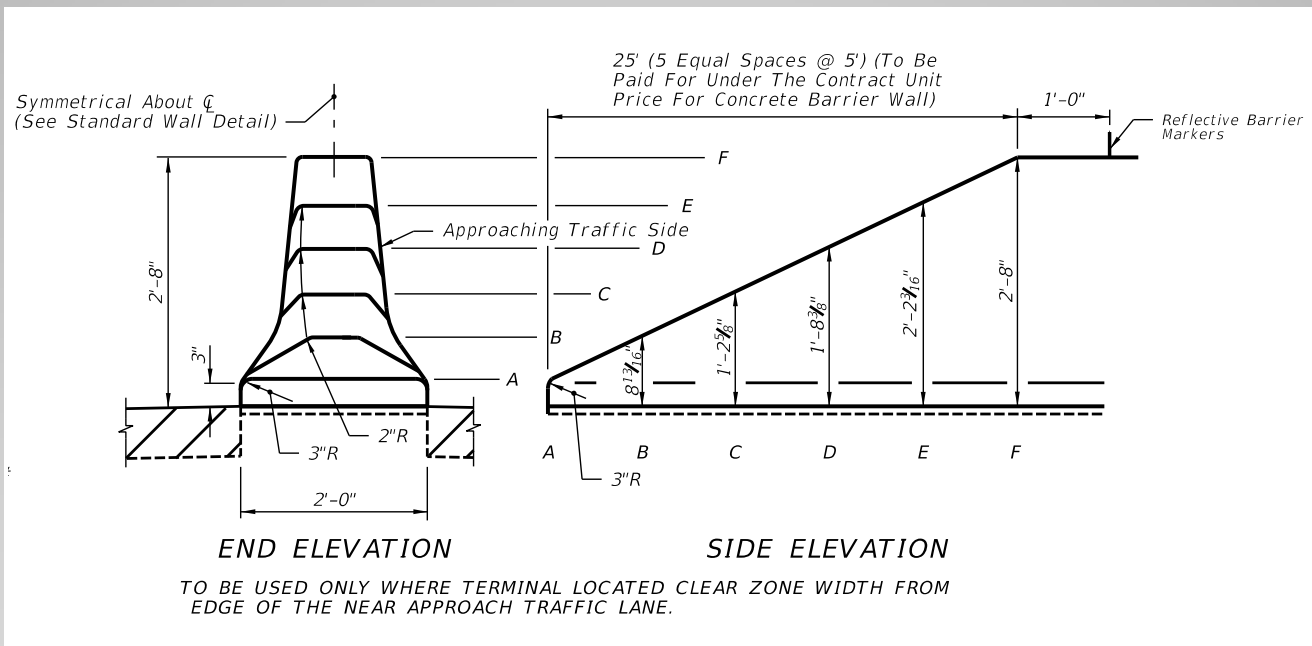
DESIGN SPEED 45 MPH OR LESS CONCRETE BARRIER WALL TERMINAL FOR NARROW MEDIAN DETAIL III

GENERAL NOTES

- Class II concrete shall be used for all reinforced and plain (nonreinforced) concrete barrier walls, except in moderately and extremely aggressive environments, Class IV concrete shall be used. All reinforcing steel with undesignated size shall be #4 bars. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 521 of the Standard Specifications, unless other finish called for in plans. The surfaces shall have a Class 5 Applied Finished Coating in accordance with Section 400 only when called for in the plans.
- Concrete barrier wall terminal notes for design speeds ≥ 50 mph.
 - Terminated outside clear zone of the approach traffic with DETAIL II end treatment.
 - Terminated within a shielded location.
 - Terminal protection by the use of a crash cushion system.
 - Terminated in conjunction with a suitably designed transition to another barrier.
- Expansion joints in wall required only at bridge ends and/or at locations where wall is an integral part of existing or proposed concrete slab; wall joints are to match an existing or proposed expansion joint.
- When the barrier is installed adjacent to the pavement the top 12" of the subgrade shall be compacted to at least 98% of the maximum density determined by FM 1-T 180, Method D.
- For cast-in-place barrier wall segments constructed with the slip form method, score 3/8" deep crack control V-Grooves while the concrete is still plastic and mold them when walls are constructed with the stationary form method. All 3/8" deep V-Grooves shall be spaced at 20' intervals, the end of the side face grooves shall be in line with the ends of the top face groove and the long dimension of all grooves shall align at 90 degrees to the longitudinal axis of the wall. When wall segments are less than 40' in length, space the V-Groove equally between open joints. Dovel transverse construction joints for abutting segments less than 40' (See Detail B).
- Precast construction is allowed as an alternate to cast-in-place construction.
 - Wall segments <40' in length shall be joined by a transverse joint in accordance with Details C & D on Sheet 2. The minimum segment length is 20'.
 - Bedding of the precast sections shall be facilitated by the use of sand-cement grout or equal method to assure uniform bearing.
 - Reinforcement may be required for handling stresses.
- On roadways designated for reverse laning all downstream ends that are not shielded or outside the clear zone shall be marked by Type 3 Object Markers.
- Cost of reinforcing steel and reflective barrier markers shall be included in the contract unit price for concrete barrier wall. See individual details for pay item information.
- For barrier wall inlet details see Indexes Nos. 217, 218 and 219.
- Concrete barrier wall with New Jersey Safety Shape may not be substituted for the Standard F Shape Barrier.

LAST REVISION 01/01/12	DESCRIPTION:	FDOT DESIGN STANDARDS FY 2012/2013	CONCRETE BARRIER WALL	INDEX NO. 410	SHEET NO. 1
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Index 410 Sheet 1

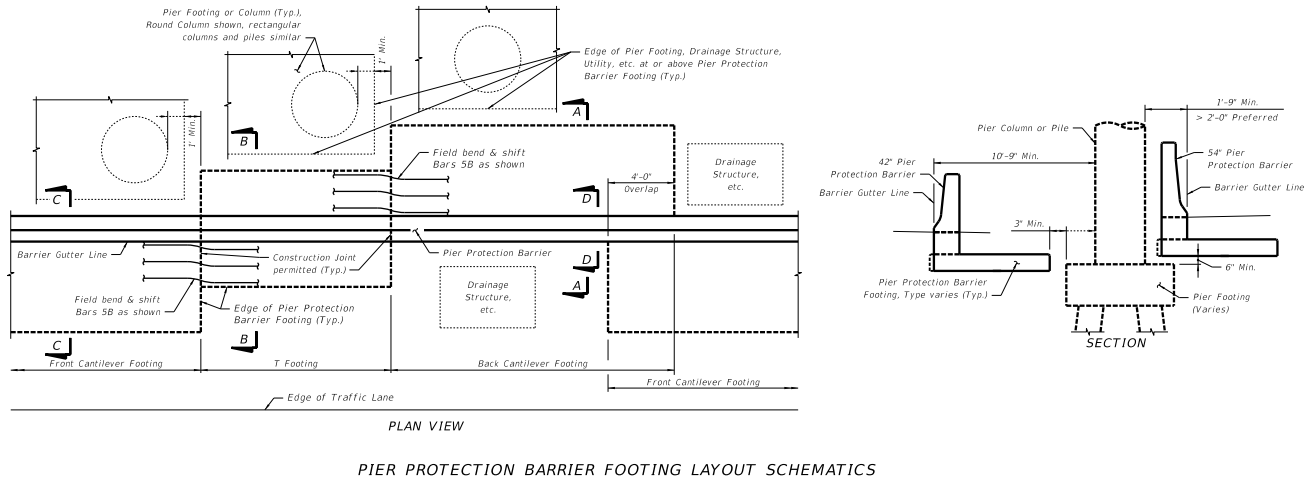


Index 411 Sheet 1

This Pier Protection Barrier has been structurally evaluated to be equivalent or greater in strength to other safety shape traffic barriers which have been crash tested to NCHRP Report 350 TL-5 criteria. This barrier meets the requirements of the AASHTO LRFD Bridge Design Specifications for a barrier used for bridge pier protection.

GENERAL NOTES

- Concrete shall be Class III or IV unless otherwise called for in the plans. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 521 of the Specifications, unless another finish is called for in the plans. The surfaces shall have a Class 5 Applied Finished Coating in accordance with Section 400 only when called for in the plans.
- Construct Pier Protection Barrier continuous without transverse contraction or expansion joints. Transverse construction joints may be used at a spacing greater than or equal to 40'. Provide longitudinal reinforcing steel continuous across construction joints.
- When the Pier Protection Barrier is installed adjacent to Roadway or Shoulder pavement, compact the top 12" of the subgrade to at least 98% of the maximum density determined by FM 1-T 180, Method D.
- Isolate Barrier Wall Inlets, Index 218, from Pier Protection Barriers and Footings with 1" expansion material.
- On roadways designated for reverse laning, mark all downstream barrier ends that are not shielded or outside the clear zone with Type 3 Object Markers. Include the cost of the Object Marker in the cost of the Pier Protection Barrier.
- Payment: Pier Protection Barrier and Crash Wall to be paid for under the contract unit price for Shoulder Concrete Barrier Wall (Rigid-Shoulder 42") LF, or Shoulder Concrete Barrier Wall (Rigid-Shoulder 54") LF.
- Provide 3/8" deep crack control V-grooves at 15' to 30' spacing. Locate V-grooves above any joint or discontinuity in the barrier footing. Align V-grooves perpendicular to the longitudinal axis of the Pier Protection Barrier and make continuous across the top surface and both side faces. For slip formed barriers, score 3/8" V-grooves while the concrete is still plastic, otherwise pre-form the joints when stationary forms are utilized.



LAST REVISION
01/01/12

DESCRIPTION:



FDOT DESIGN STANDARDS
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PIER PROTECTION BARRIER

INDEX NO.
411

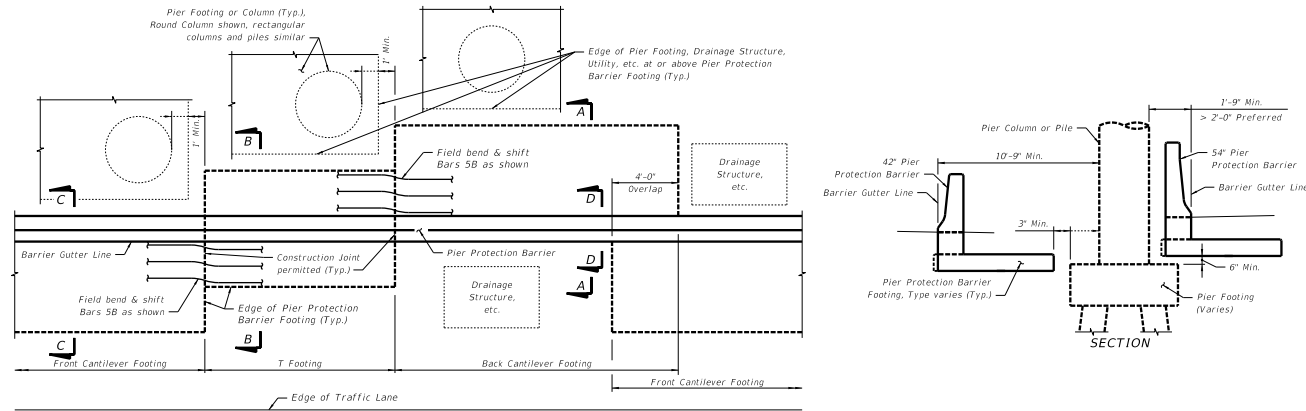
SHEET NO.
1

Index 411 Sheet 1

This Pier Protection Barrier has been structurally evaluated to be equivalent or greater in strength to other safety shape traffic barriers which have been crash tested to NCHRP Report 350 TL-5 criteria. This barrier meets the requirements of the AASHTO LRFD Bridge Design Specifications for a barrier used for bridge pier protection.

GENERAL NOTES

- Concrete shall be Class III or IV unless otherwise called for in the plans. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 521 of the Specifications, unless another finish is called for in the plans. The surfaces shall have a Class 5 Applied Finished Coating in accordance with Section 400 only when called for in the plans.
- Construct Pier Protection Barrier continuous without transverse contraction or expansion joints. Transverse construction joints may be used at a spacing greater than or equal to 40'. Provide:
- When the Pier Protection Barrier is installed adjacent to Roadway or Shoulder pavement, compact the top 12" of the subgrade to at least 98% of the maximum density determined by FM T-180, Method D.
- Provide barrier top finish, unless noted, from Pier Protection Barriers and Footings with 1" expansion material.
- On roadways designated for reverse laning, mark all downstream barrier ends that are not shielded or outside the clear zone with Type 3 Object Markers. Include the cost of the Object Marker in the cost of the Pier Protection Barrier.
- Payment: Pier Protection Barrier and Crash Wall to be paid for under the contract unit price for Shoulder Concrete Barrier Wall (Rigid-Shoulder 42') LF, or Shoulder Concrete Barrier Wall (Rigid-Shoulder 48') LF.
- Provide 3/8" deep crack control V-grooves at 15' to 30' spacing. Locate V-grooves above any joint or discontinuity in the barrier footing. Align V-grooves perpendicular to the longitudinal axis of the Pier Protection Barrier and make continuous across the top surface and both side faces. For slip formed barriers, score 3/8" V-grooves while the concrete is still plastic, otherwise pre-form the joints when stationary forms are utilized.



PLAN VIEW
PIER PROTECTION BARRIER FOOTING LAYOUT SCHEMATICS

LAST REVISION 01/01/12	DESCRIPTION:	 FDOT DESIGN STANDARDS FY 2012/2013	PIER PROTECTION BARRIER	INDEX NO. 411	SHEET NO. 1
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Index 411 Sheet 1

3. *When the Pier Protection Barrier is installed adjacent to Roadway or Shoulder pavement, compact the top 12" of the subgrade to at least 98% of the maximum density determined by FM 1-T 180, Method D.*

7. *Provide 3/8" deep crack control V-grooves at 15' to 30' spacing. Locate V-grooves above any joint or discontinuity in the barrier footing. Align V-Grooves perpendicular to the longitudinal axis of the Pier Protection Barrier and make continuous across the top surface and both side faces. For slip formed barriers, score 3/8" V-Grooves while the concrete is still plastic, otherwise pre-form the joints when stationary forms are utilized.*

Index 430

- Was removed from the FY 12/13 eBooklet
 - Ongoing research
 - Future Action to be Determined

Index 430

- For guidance on Selection of Crash Cushions please see the Basis of Estimates website at:

<http://www.dot.state.fl.us/Specificationsoffice/Estimates/BasisofEstimates/BOEManual/BOEOnline.shtm>

FDOT, Specs and Estimates - BOE Manual - Windows Internet Explorer

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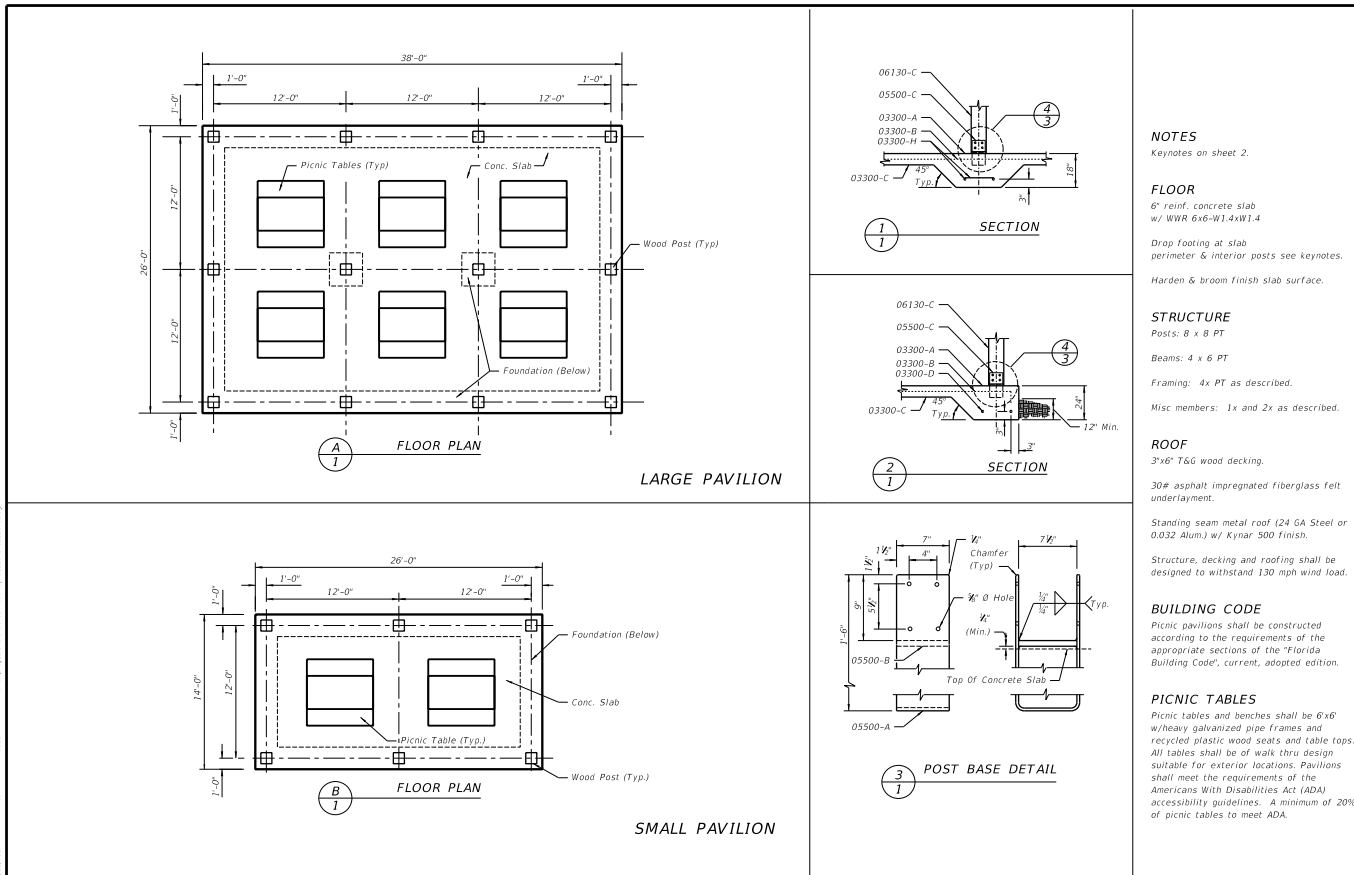
Chapter 11	Items 000 through 199 Quick Reference: Crash Cushion Pay Item Selection , for Estimates Bulletin 11-10 Crash Cushions , Graphic updated 4-6-12 for multiple projects on a contract.	4-6-12
Chapter 12	Items 200 through 299	3-19-12
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Master Pay Item List	Master Pay Item List for Comp Book Current pay items in Excel (.xlsx) format, used for Computation Book Forms. Other formats are available at http://www.dot.state.fl.us/specificationsoffice/Estimates/BasisofEstimates/Default.shtm#Master	automated; monthly
Cover and Dividers	Cover and Section Dividers, 2012 Edition	3-19-12

Note: The Basis of Estimates is a design tool. It is not a contract document. All requirements, measurement, and payment details need to be included in the contract documents: plans, design standards, and/or specifications. Refer to the Introduction and Chapter 6 for additional information regarding the use of the BOE and specific pay item details.

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NOTES

Keynotes on sheet 2.

FLOOR

6" reinf. concrete slab w/ WWR 6x6-W1.4xW1.4

Drop footing at slab perimeter & interior posts see keynotes.

Harden & broom finish slab surface.

STRUCTURE

Posts: 8 x 8 PT

Beams: 4 x 6 PT

Framing: 4x PT as described.

Misc members: 1x and 2x as described.

ROOF

3"x6" T&G wood decking.

30# asphalt impregnated fiberglass felt underlayment.

Standing seam metal roof (24 GA Steel or 0.032 Alum.) w/ Kynar 500 Finish.

Structure, decking and roofing shall be designed to withstand 130 mph wind load.

BUILDING CODE

Picnic pavilions shall be constructed according to the requirements of the appropriate sections of the "Florida Building Code", current, adopted edition.

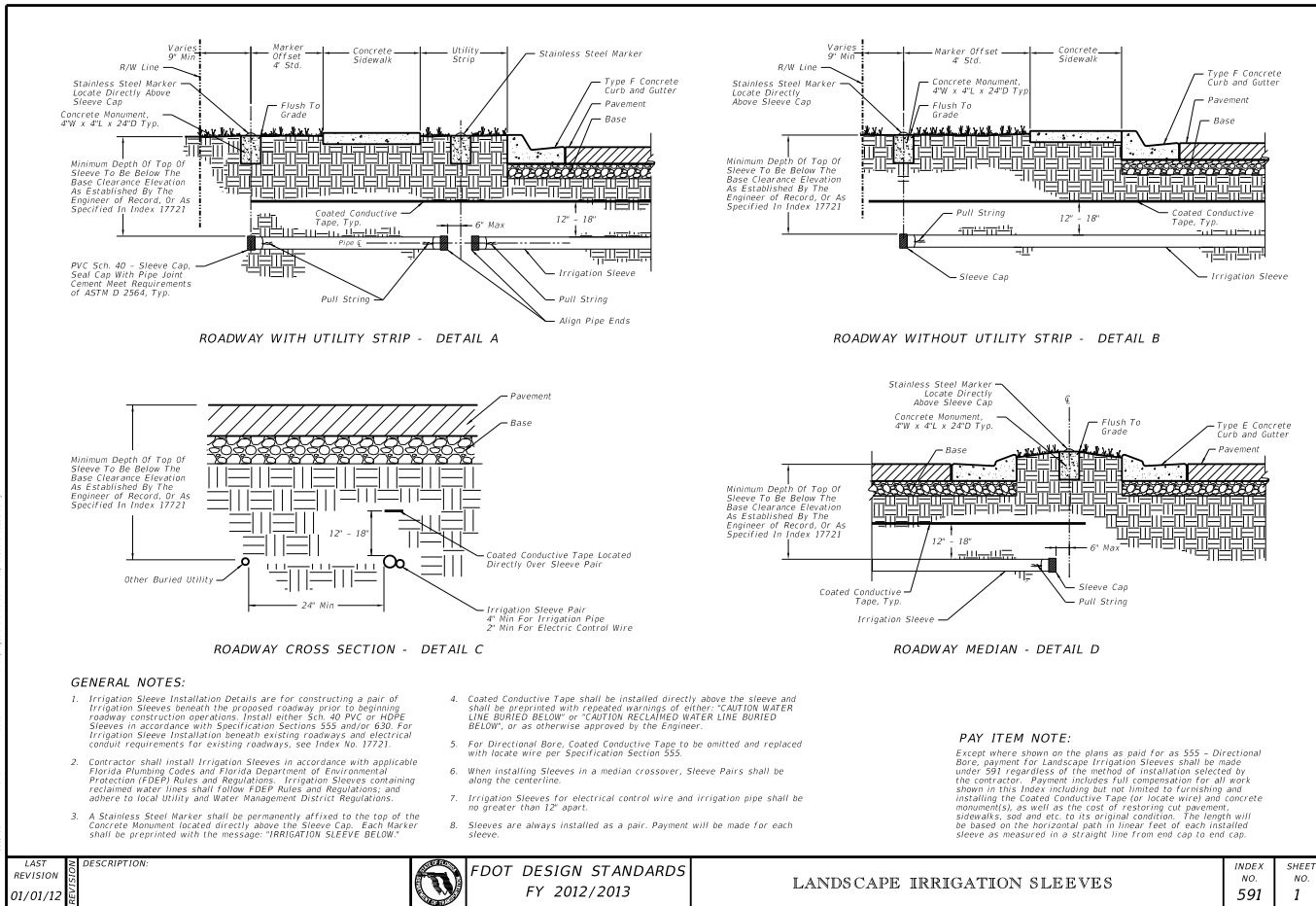
PICNIC TABLES

Picnic tables and benches shall be 6'x6' w/heavy galvanized pipe frames and recycled plastic wood seats and table tops. All tables shall be of walk thru design suitable for exterior locations. Pavilions shall meet the requirements of the Americans With Disabilities Act (ADA) accessibility guidelines. A minimum of 20% of picnic tables to meet ADA.

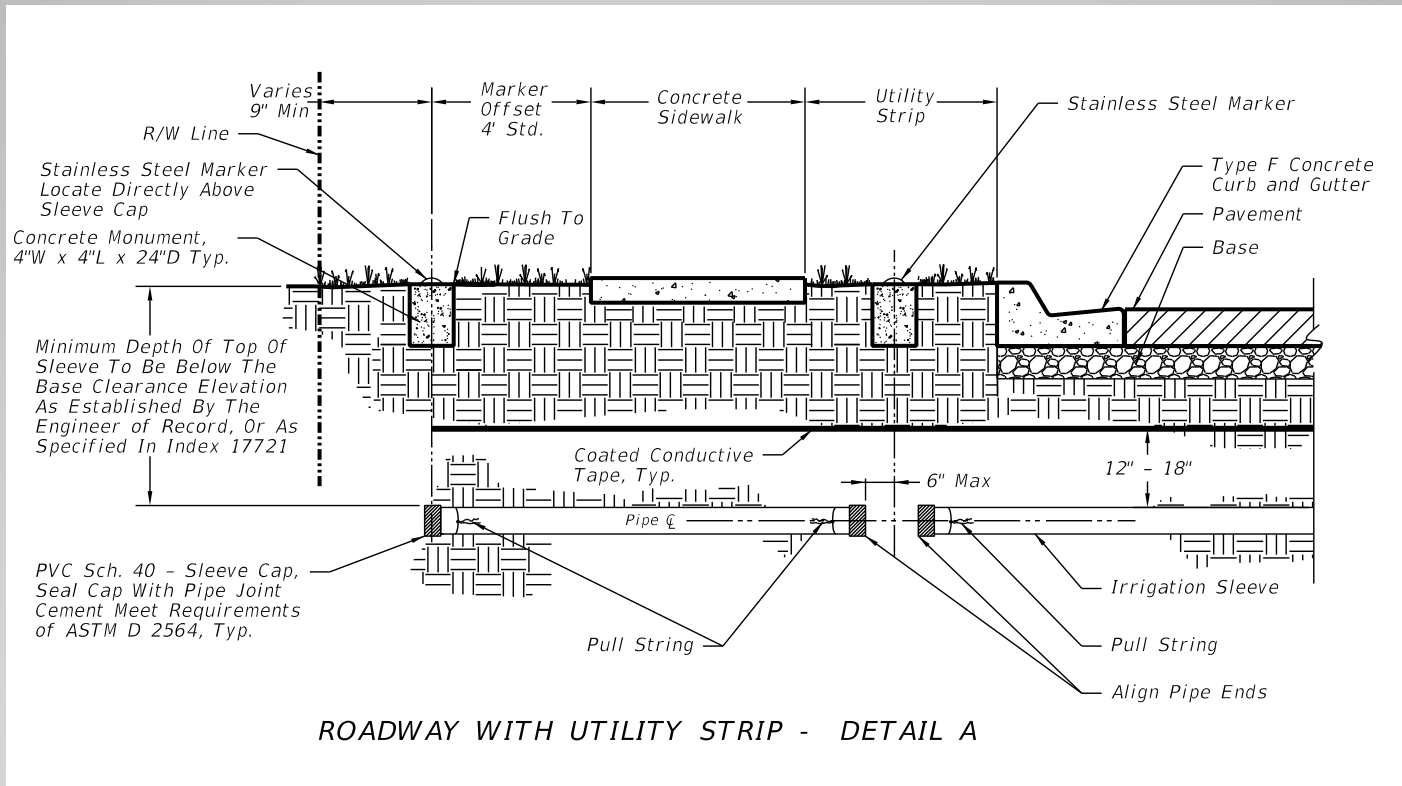
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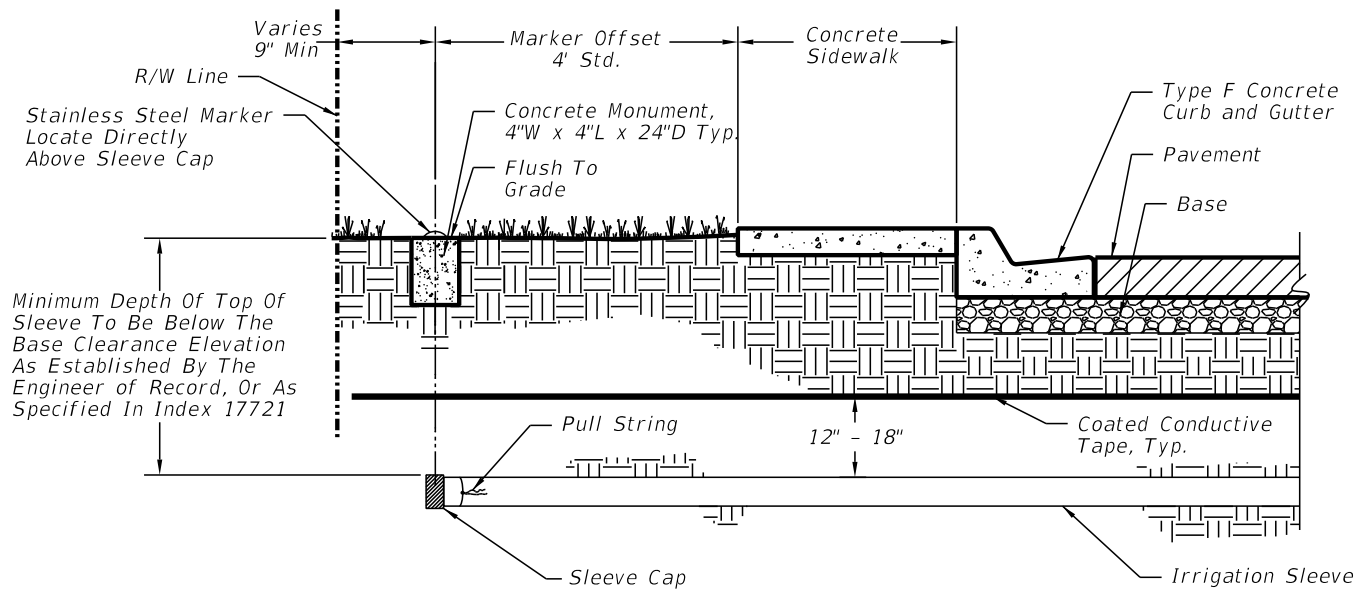


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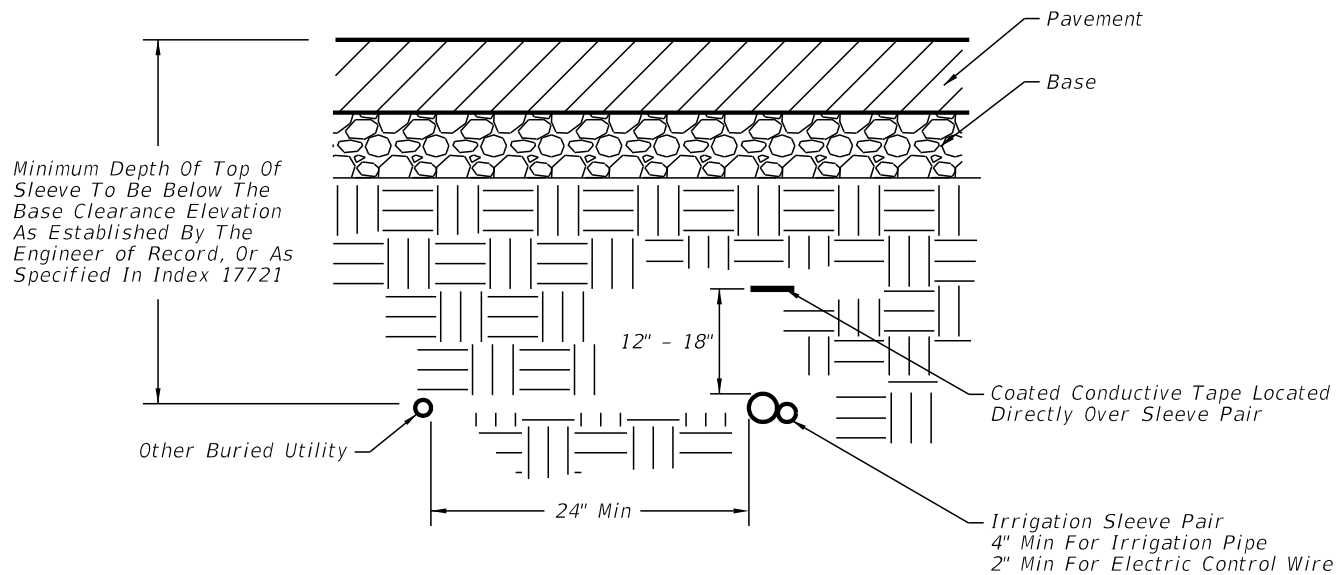
ROADWAY WITH UTILITY STRIP - DETAIL A

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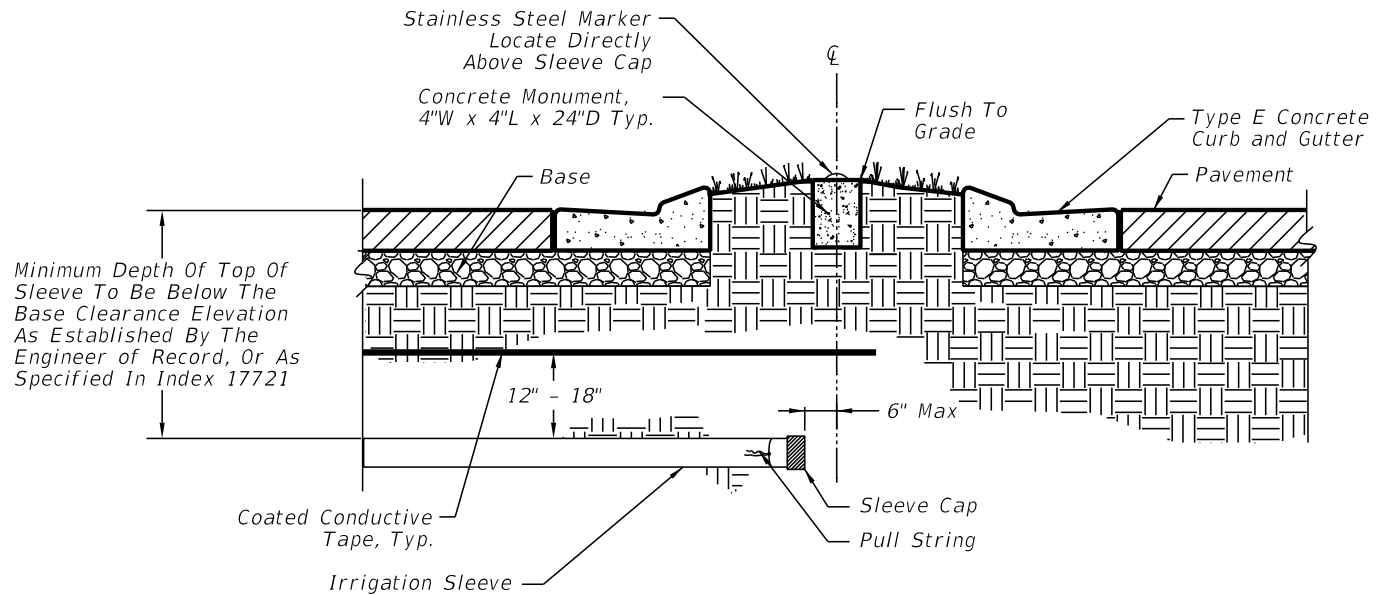
ROADWAY WITHOUT UTILITY STRIP - DETAIL B

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ROADWAY CROSS SECTION - DETAIL C

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ROADWAY MEDIAN - DETAIL D

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NOTES

PIPE RAILING & POSTS:

Structural Tube Pipe and Bar shall be in accordance with ASTM B221 or ASTM B429. Alloy 6061-T6 End Rail 90° bends and corner bends with maximum 4'-0" post spacing, may be Alloy 6063-T6. Posts and End Rails shall be fabricated and installed plumb, ± 1" tolerance when measured at 3'-6" above the foundation. Corners and changes in tangential longitudinal alignment, may be made continuous with a 9" bend radius or terminated at adjoining sections with a standard end hoop when handrails are not required. For changes in tangential longitudinal alignment greater than 45°, posts shall be positioned at a maximum distance of 2'-0" each side of the corner and shall not be located at the corner apex. For curved longitudinal alignments the top and bottom rails and handrails shall be shop bent to match the alignment radius.

RAILING MEMBER DIMENSIONS TABLE			
MEMBER	DESIGNATION	OUTSIDE DIMENSION	WALL THICKNESS
Posts	2" NPS (Sch. 40)	2.375"	0.154"
Rails	2" NPS (Sch. 40)	2.375"	0.154"
Rail Joint/Splice Sleeves	1½" NPS (Sch. 40)	1.900"	0.145"
Handrails Joint/Splice Sleeves	1" NPS (Sch. 40)	1.315"	0.133"
Handrails	1½" NPS (Sch. 40)	1.900"	0.145"
Handrail Support Bar	1" Ø Round Bar	1.000"	N/A

BASE PLATES:
Base Plates shall be in accordance with ASTM B209, Alloy 6061-T6.

SHIM PLATES:
Shim Plates shall be aluminum in accordance with ASTM B209, Alloy 6061 or 6063. Shim plates shall be used for foundation height adjustments greater than ¼", and localized irregularities greater than ¼". Field trim shim plates when necessary to match the contours of the foundation. Beveled shim plates may be used in lieu of trimmed flat shim plates shown. Stacked shim plates must be bonded together with adhesive bonding material and limited to a maximum total thickness of ¼"; unless longer anchor bolts are provided for the exposed thread length.

COATINGS:
The aluminum railing shall be mill finish unless otherwise noted in the Contract Documents. All nuts, bolts and washers shall be hot-dip galvanized in accordance with Section 962 of the Specifications.

ANCHOR BOLTS:
Anchor bolts shall be in accordance with ASTM F1554 Grade 36. Headless anchor bolts for Adhesive Anchors shall be threaded full length. Cutting of reinforcing steel is permitted for drilled hole installation. All anchor bolts shall have single self-locking hex nuts. Tack welding of the nut to the anchor bolt may be used in lieu of self-locking nuts. All nuts shall be in accordance with ASTM A663 or ASTM A194. Flat Washers shall be in accordance with ASTM F436 and Plate Washers (for long slotted holes only) shall be in accordance with ASTM A36 or ASTM A709 Grade 36. After the nuts have been snug tightened, the anchor bolt threads shall be distorted to prevent removal of the nuts. Distorted threads and tack welds shall be coated with a galvanizing compound in accordance with the Specifications.

RESILIENT AND NEOPRENE PADS:
Resilient and Neoprene pads shall be in accordance with Specification Section 932, except that testing of the finished pads shall not be required. Neoprene pads shall be durometer hardness 60 or 70.

JOINTS:
All fixed joints are to be welded all around and ground smooth. Expansion Joints shall be spaced at a maximum of 30'-0". Field splices similar to the expansion joint detail may be approved by the Engineer to facilitate shipping and handling, but rails must be continuous across a minimum of two posts. Only use the continuity Field Splice (Detail "E") to make the railing continuous for unforeseen field adjustments.

WELDING:
All welding shall be in accordance with the American Welding Society Structural Welding Code (Aluminum) ANSI/AWS D1.2 (current edition). Filler metal shall be either ER5183, ER5356 or ER5556. Nondestructive testing of welds is not required.

SHOP DRAWINGS:
Complete details addressing project specific geometry (line & grade) showing post and expansion joint locations must be submitted by the Contractor for the Engineer's approval prior to fabrication of the railing. Shop drawings shall be in accordance with the Specifications.

PAYMENT:
Guiderail shall be paid for under the contract unit price for Pipe Guiderail (Aluminum), LF (Item No. S15-1-2). Payment for the Guiderail will be plan quantity measured as the length along the center line of the top rail, and includes rails, posts, rail splice assembly, base plates, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the Guiderail.

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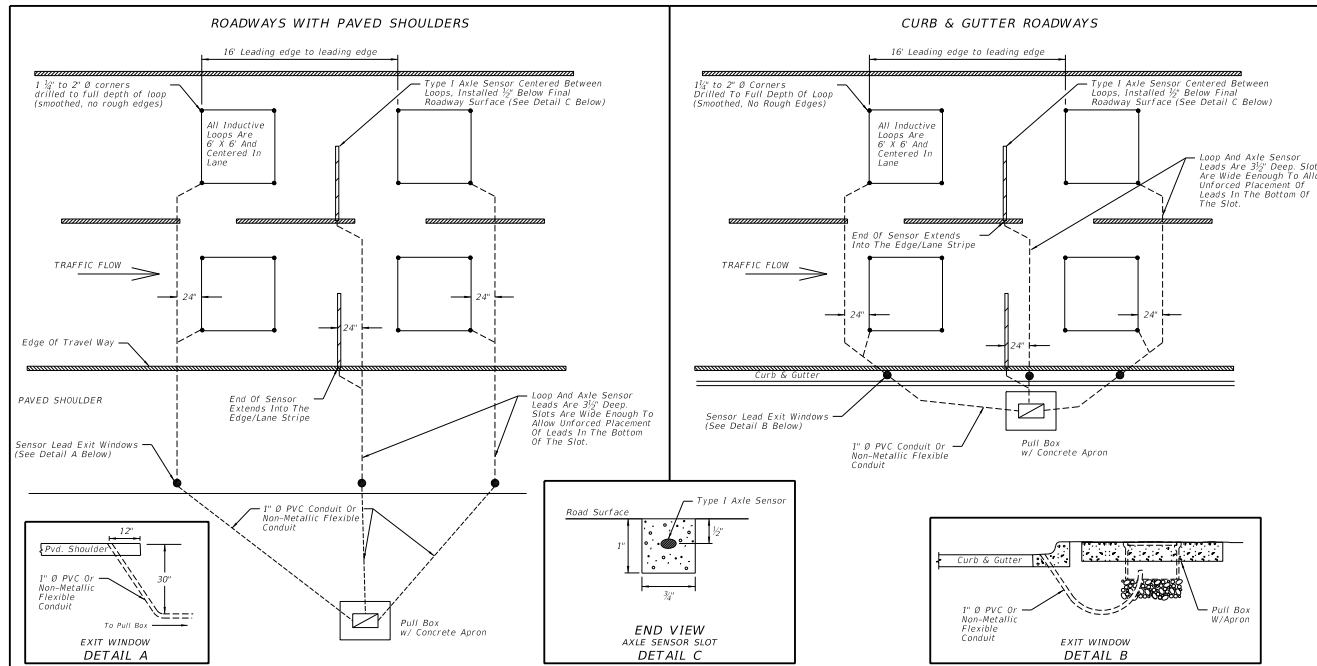
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ALUMINUM PIPE GUIDERAIL

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Index 17900 Sheet 5

TYPICAL FOR UP TO 4 LANES OF SENSOR LEADS PULLED TO ONE SIDE OF THE ROADWAY



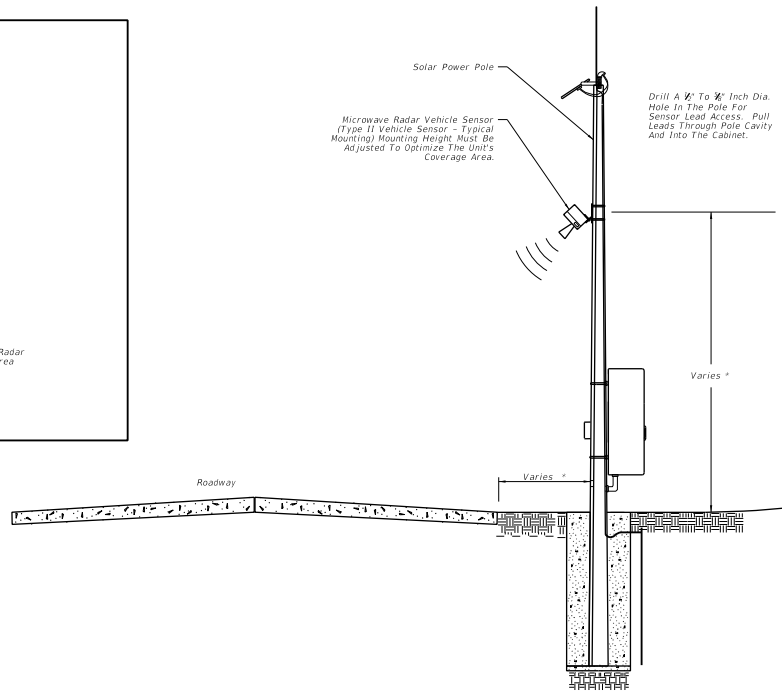
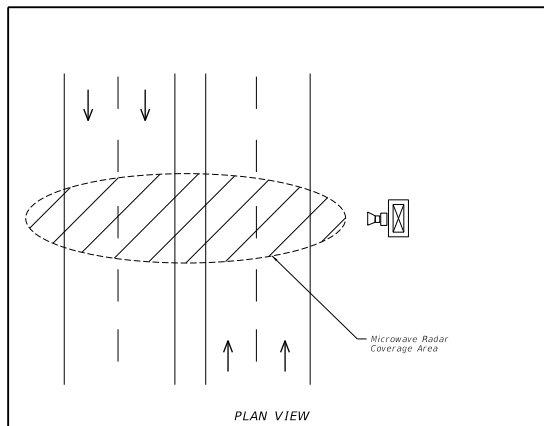
NOTES:

- Type I axle sensors shall be installed after placement of the friction course. Loops associated with axle sensors shall also be installed after placement of the friction course.
- Inductive loops slots shall be cut 3 1/2" deep. Loop slots will be cut wide enough to allow unforced placement of the wire into the bottom of the slot. Four turns of #12 AWG, type XHHW stranded copper wire, or #14 AWG, IMSA 51-7 copper wire shall be placed in the slot. Short pieces of backer rod (2" to 3" in length) shall be placed every 18" to 24" to hold the loop wire in the bottom of the slot.
- Loop leads shall be twisted at the rate of 6 to 8 twists per foot. For loops that are within 150' of the cabinet, the twisted pair loop wire shall be extended directly to the cabinet and no shielded lead-in cable is required. For distances over 150', #14 IMSA 50-2 shielded lead-in cable must be spliced to the loop wire twisted pair at the first pull box to which the loop wire is pulled.
- The Contractor shall be responsible for contacting the FDOT office that maintains the traffic monitoring site in order to obtain lane numbering identification. All leads shall be labeled with permanent markers to indicate their lane number and position. For example: The leading loop (the first loop a vehicle encounters) in the lane designated as number 1, shall be marked as "1A". The trailing loop, if present, shall be marked "1B". If an axle sensor is present, the sensor will be marked as "P1" for lane #1, P2 for lane #2, and so on for all lanes.
- See Index 17700 for pull box and apron details.
- All splices will be performed using splice kits designed for direct burial. Splice kits will include screw on wire connectors and a housing with sufficient sealant to fully encapsulate the spliced connections. Taped splices are not permitted.

LANE LAYOUT FOR TMS INDUCTIVE LOOP AND TYPE I AXLE SENSOR

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The Unit Must Be Capable Of Detecting Up To Eight Lanes Of Traffic (In Either Or Both Directions) When Mounted Perpendicular To The Roadway.

Coverage Area Of The Unit Is Affected By The Roadway Geometry: Distance From The Travel Lanes, Median Type And Width, Barrier Walls, Etc.

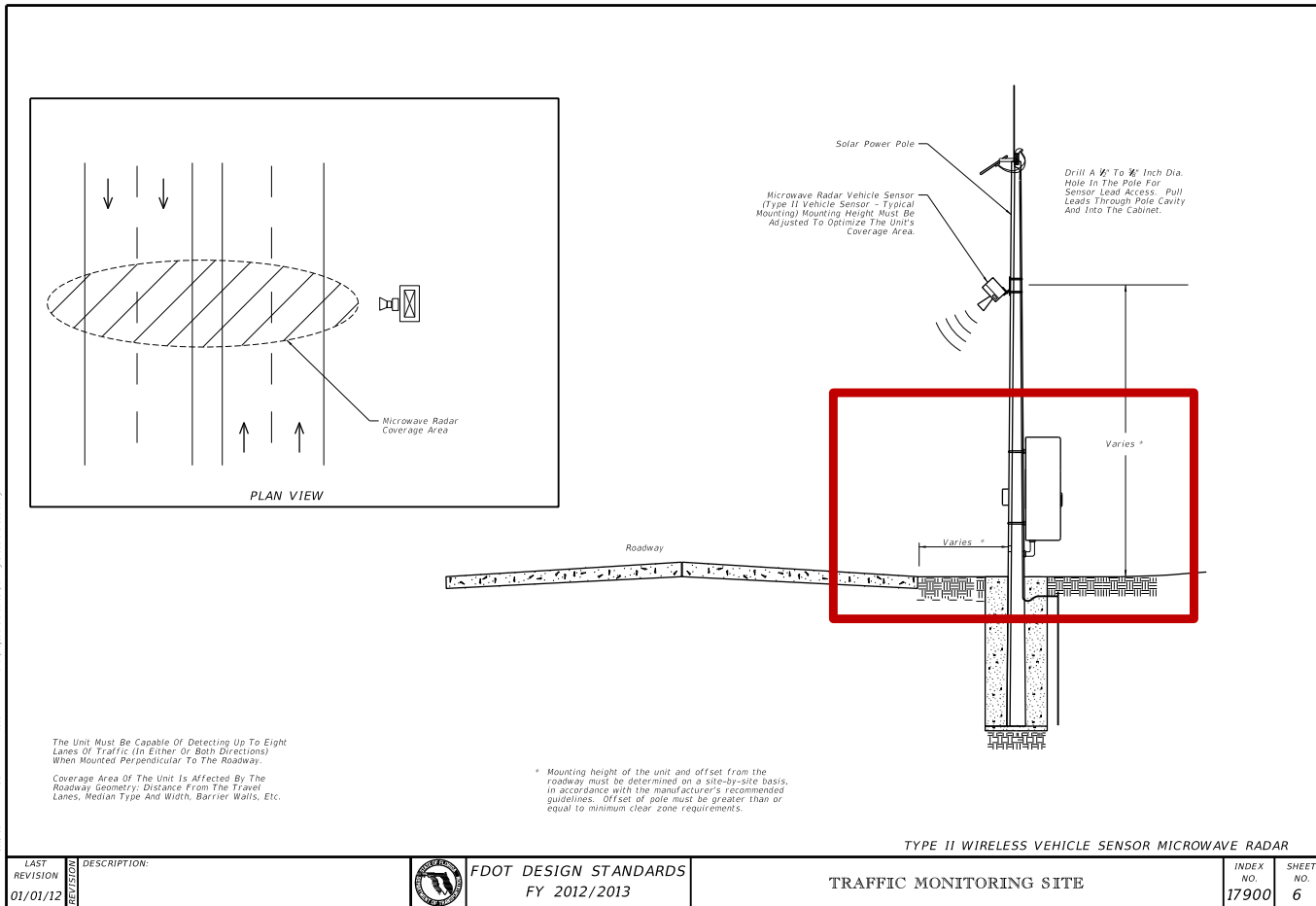
* Mounting height of the unit and offset from the roadway must be determined on a site-by-site basis, in accordance with the manufacturer's recommended guidelines. Offset of pole must be greater than or equal to minimum clear zone requirements.

TYPE II WIRELESS VEHICLE SENSOR MICROWAVE RADAR

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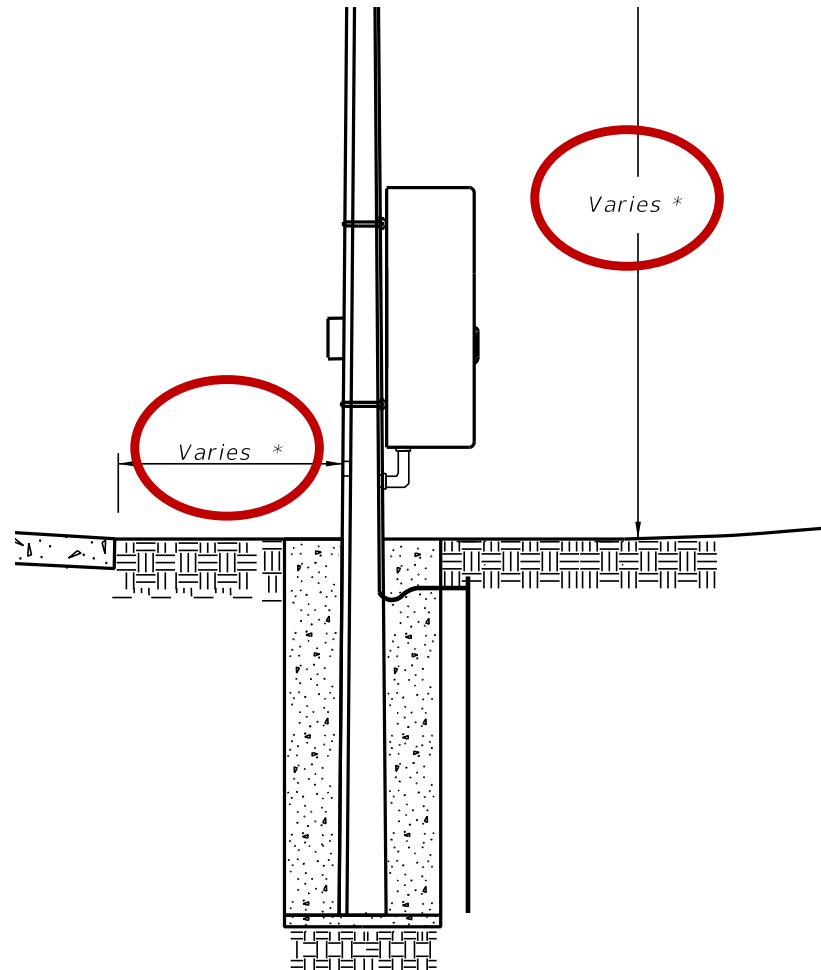
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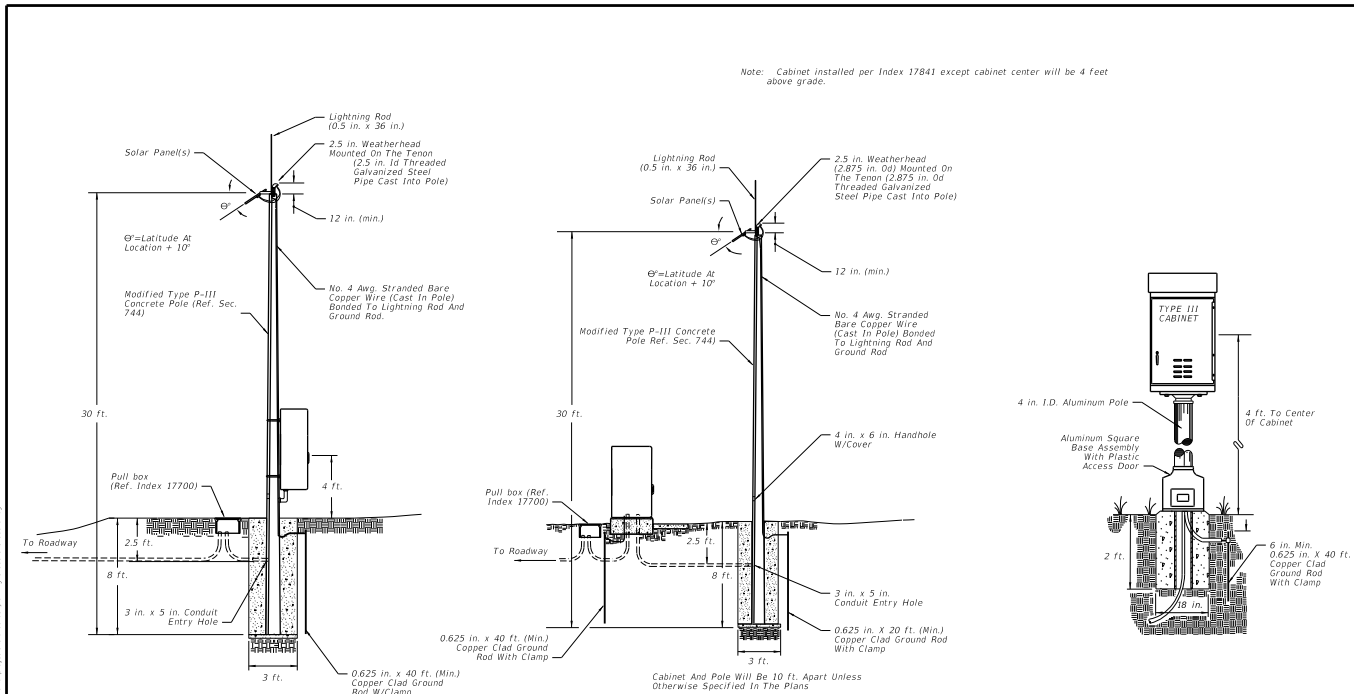


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Index 17900 Sheet 7



SOLAR POWER POLE WITH POLE MTD. CABINET

SOLAR POWER POLE WITH BASE MTD. CABINET

PEDESTAL MTD. CABINET

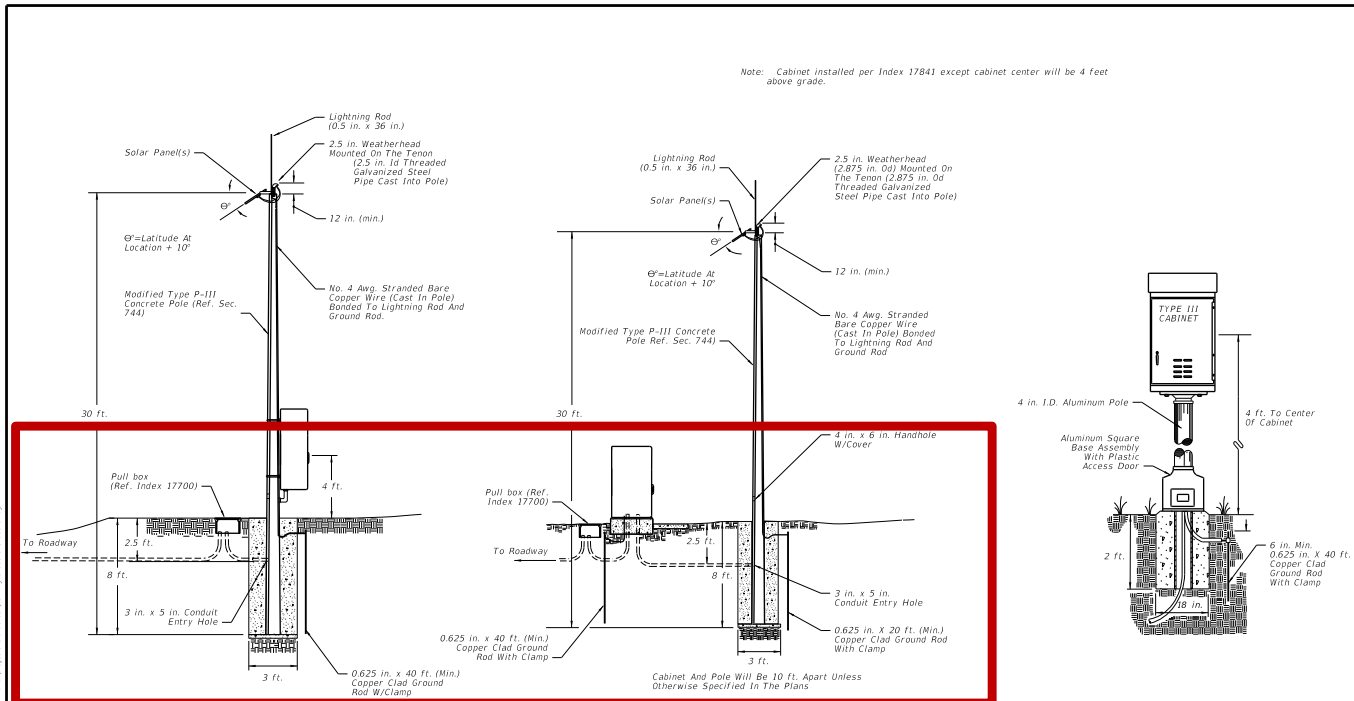
Wire for Solar Panel Array installations shall be #10 AWG stranded copper, Red insulation is THHN or THWN for positive 12 volts wiring, Black insulation is THHN or THWN for negative, 12 volts wiring. Green insulation is THHN or THWN for ground bonding of the solar panel frame to the pole and earth.

Pole placement shall be in accordance with section 125.4 and 125.8.2 of the Standard Specifications.

SOLAR POWER POLE DETAIL

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SOLAR POWER POLE WITH BASE MTD. CABINET

PEDESTAL MTD. CABINET

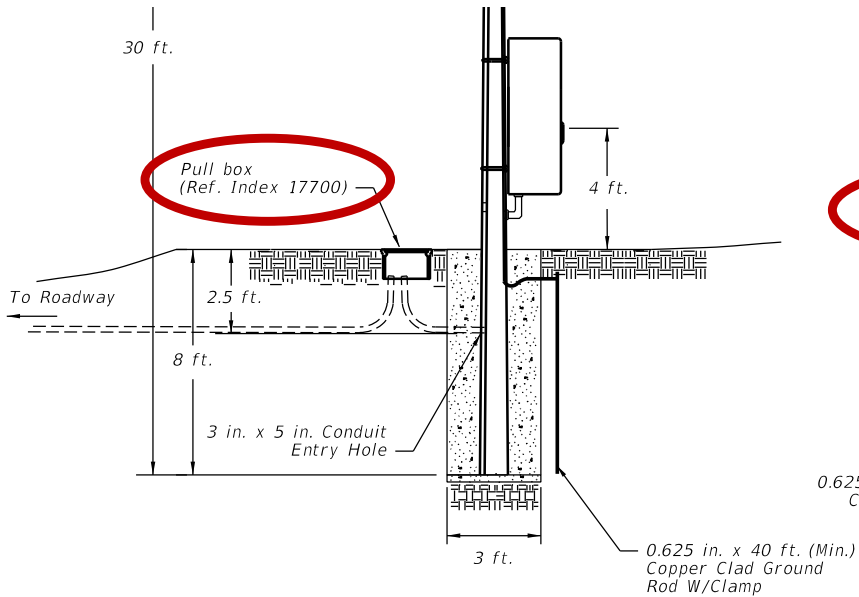
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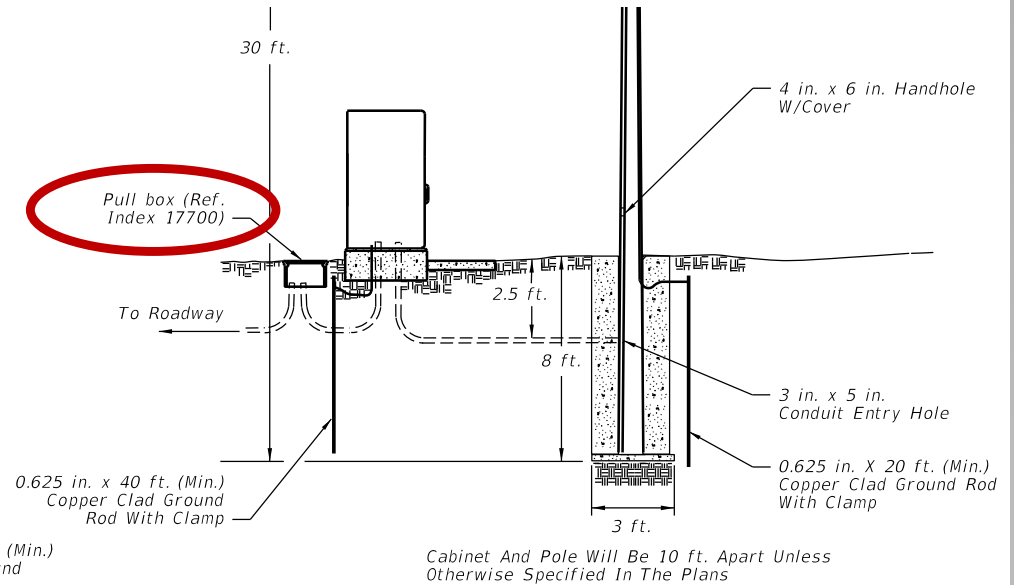
SOLAR POWER POLE DETAIL

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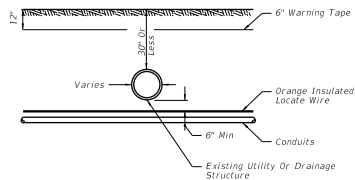
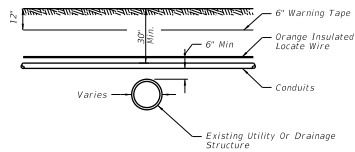
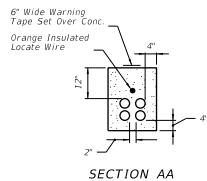
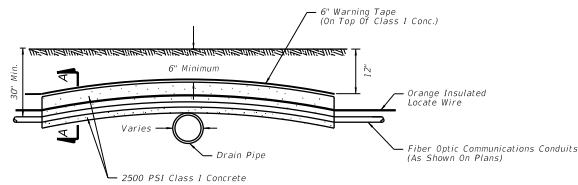


**SOLAR POWER POLE
WITH POLE MTD. CABINET**

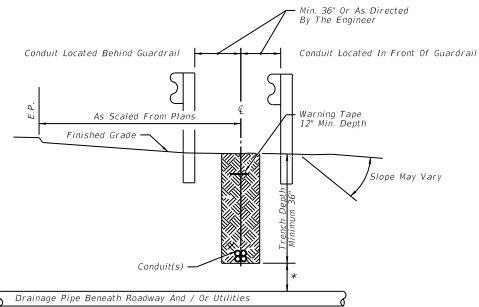


**SOLAR POWER POLE
WITH BASE MTD. CABINET**

Index 18202



CONDUIT INSTALLATION DETAILS ACROSS EXISTING DRAIN PIPES OR UTILITIES




* Maintain 12" Minimum Vertical Clearance When Crossing Over Pipe And / Or Utilities. If Minimum Vertical Clearance Cannot Be Maintained, Then Conduit Is To Be Routed Under Pipe Maintaining 12" Minimum Vertical Clearance.

GENERAL NOTES:

1. The contractor, with approval from the Engineer, may adjust the final burial depth of the conduit(s) in order to transverse nonmovable object conflicts.
2. Backfill with excavated material and compact the soil until firm and unyielding. Remove rock and debris from backfill material.
3. Where conduits are to be installed over existing underground structures (e.g., drain pipes or utility lines) which are less than 30" deep, the contractor shall encase the conduit in 2500 PSI Class I concrete for the entire length of conduit that is installed at a depth of less than 30".
4. If the amount of cover over the encasement is less than 6", the contractor shall install the conduit to pass below the underground structures (e.g., drain pipes).
5. Size and type of fiber optic conduits shall be shown on plans.

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2004	S	I	N/A	1-Jan-06 English		1-Jul-05 English		
2002	S	I	N/A	N/A				
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2004	S	I	N/A	1-Jan-06 English		1-Jul-05 English	
2002	S	I	N/A	N/A			
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2008	<u>S</u>	<u>I</u>	N/A	<u>1-Jan-10</u>	<u>1-Jul-09</u>	<u>1-Jan-09</u>	<u>1-Jul-08</u>	
2006	<u>S</u>	<u>I</u>	N/A	<u>1-Jan-08 Eng</u>	<u>1-Jul-07 Eng</u>	<u>1-Jan-07 Eng</u>	<u>1-Jul-06 Eng</u>	
2004	<u>S</u>	<u>I</u>	N/A	<u>1-Jan-06 English</u>		<u>1-Jul-05 English</u>		
2002	<u>S</u>	<u>I</u>	N/A	N/A				
2000	<u>S</u>	<u>I</u>	N/A	<u>1-Jan-06 Metric</u>		<u>1-Jul-05 Metric</u>		

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Design Standards eBooklet

Fiscal Year 2012/2013 Effective Date 7/1/2012



You must have the free [Adobe Acrobat Reader](#) to view and/or print these files. Entire groups may be printed by selecting the group name. The default print size for the Design Standard drawing files is 11 X 17 inches. Any available Instructions for Design Standards (IDS) are listed with their related Index. For questions, please contact the person noted under the area of responsibility listed beside the group headings (click on link for contact information). For use concerning plans incorporation and effective dates for the Design Standards and for information on the Data Tables select the [General Web Site Information](#) link.

Design Standards eBooklet		Index Title	Revision	Design Information		
				Instructions for Design Stds (IDS)	Data Table Cell Library	Borderless DGNs
Index No.	Sheets					
(PDF)			(PDF)	(ZIP)	(ZIP)	Terms of Use
Complete eBooklet (272mb)	933	Fiscal Year 2012/2013 Design Standards eBooklet		Complete IDS (11mb)	Complete CELs (1mb)	Complete DGNs (52mb)
* COVER, TABLE OF CONTENTS AND REVISIONS *						
Cover	3	2010 Design Standards Booklet Cover		Cover		
Content	2	Table of Contents		Content		
Revisions	4	Booklet Revisions		Introduction		
* ABBREVIATIONS AND SYMBOLS *						
001	4	Standard Abbreviations				Roadway Contact
002	3	Standard Symbols				
* EROSION CONTROL AND WATER QUALITY *						
104	2	Permanent Erosion Control				Drainage Contact
105	4	Standard Symbols and Tables of Erosion Control				

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2002	S	I	N/A	N/A			
2000	S	I	N/A	1-Jan-06 Metric		1-Jul-05 Metric	

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Design Standards Revision
Fiscal Year 2012/2013



REVISION	Index No. (PDF)	Sheets	Description	Effective Date	Design Bulletin Number
R1301	400	13,17,18,22, 26	Index 400 revisions due to payment issues related to Bridge Anchorage, Pipe Rail and Rub Rail	07/01/2012	RDB12-06
	414	1	Added Alternative Design Requirements		
	619	1 & 2	Revision of Multi-Lane details (>3 lanes)		

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Design Developmental Index No. (PDF)	Title	Monitor	Instructions for Developmental Design Stds (PDF)	Applicable Developmental Specifications? (YES/NO)
*WALL SYSTEMS *				
D06025	GRS-IBS	Larry Jones	IDDS-D06025	YES
*TRAFFIC SIGNAL AND EQUIPMENT *				
D17749	Damping Device for Miscellaneous Structures	Gevin McDaniel	IDDS-17749	NO
* PRESTRESSED CONCRETE INVERTED-T BEAMS *				
D20310	Typical Inverted-T Beam Details and Notes	Gevin McDaniel	IDDS-20310	NO
D20320	Inverted-T Beam Standard Details			
* PRESTRESSED CONCRETE SLAB UNITS *				
D20350	Prestressed Slab Units	Gevin McDaniel	IDDS-20350	YES
D20353	12" Custom Width Prestressed Slab Unit-Standard Details			
D20354	12"x48" Prestressed Slab Unit - Standard Details			
D20355	12"x60" Prestressed Slab Unit - Standard Details			
D20363	15" Custom Width Prestressed Slab Unit-Standard Details			
D20364	15"x48" Prestressed Slab Unit - Standard Details			
D20365	15"x60" Prestressed Slab Unit - Standard Details			
D20399	Overlay & Deflection Data for Prestressed Slab Units			

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Our Mission: The Office of Design leads, guides and supports the design community to deliver innovative transportation solutions.

The Office of Design consists of 150+ people in six offices dedicated to the production of the plans and specifications necessary to implement the Department of Transportation's Work Program.

[Engineering/CADD Systems](#)
The Engineering/CADD Systems Office procures, develops and supports software applications used by the Department's engineering community. We also provide training in the use of our CADD products.

[Production Support](#)
Provides production support to the Office of Design as well as management and guidance for the Department's Value Engineering program, Local Agency Program, Project

Thank You!

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